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# REPORT OF THE

# *Secretary of Agriculture*

# 1941

E. C. AUCHTER

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# Postscript

After this report had gone to the printer, Japan attacked us; we became involved in war. This obliges me to add a postscript. There is nothing in the report that need be changed; the wartime task of the Department and of Agriculture, which the report describes, is the same as it was before. It is to provide food for freedom, without waste of land, labor, or machinery. But with the United States at war, the task is more difficult. Moreover, it enlists new motives and a deeper patriotism.

Greater difficulty in the task results from the drain that war involves on the supply of agricultural labor, machinery, and other means of production and from the fact that the spread of naval fighting reduces imports. With scantier facilities, agriculture must produce a greater output. New motives enter the agricultural assignment because defense now involves fighting as well as production. Producing foods for our own immediate use in warfare, as well as for the use of our allies, summons every participant to a greater unselfish effort. There can be no question of making price the chief incentive. First among the driving forces is awareness of the Nation's danger and of the fact that the ultimate reward is victory or nothing.

Ideally performed the agricultural task would give us what we need for our own consumption and for our allies and nothing else. It would suspend the production of surpluses. All misdirected effort in wartime is waste. We shall not attain the ideal, but we shall move toward it. We shall increase the production of the concentrated foods, which pack much nourishment in little space, and we shall reduce the output of crops like cotton, wheat, and tobacco of which we have enough already. And since manpower will be scarce and the substitution of machinery difficult, we shall draft science more than ever before.

Broadly, despite the handicaps, we are ready for the ordeal. Foresight and statesmanship have given us an ever-normal granary, stored with feeds that can be converted into foods. Foresight and statesmanship have provided also a Nation-wide farm adjustment system, which functions as well in high as in low gear, and which is capable of mobilizing the resources of almost every farm. It is the duty of the Department and of the farmers to make the fullest use of these facilities, with national safety rather than agricultural advantage as the goal. Let us remember the parable of the talents. History will judge us by what we do with what we have.

C. R. W.

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# *Secretary of Agriculture*

# 1941

WASHINGTON, NOVEMBER 1, 1941

*To the President*

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## IMPACT OF WAR AND DEFENSE EFFORT ON AGRICULTURE

IN 1941 AMERICAN AGRICULTURE took the offensive in the world battle for democracy and civilization. It revised its production program from top to bottom, inscribed "Food for Freedom" on its banner, and matched the industrial defense effort with a corresponding drive for agricultural necessities. Under Federal guidance it shifted the farm adjustment machinery from low to high gear, with special emphasis on livestock, poultry and dairy products, and certain fruits and vegetables. These are the commodities that the country needs increasingly for its own consumption and also for export to Great Britain and other countries under the Lend-Lease Act.

Many people, even in agriculture, do not understand the need. They know that the Nation's total food consumption can rise only very slowly under the most favorable conditions and that the war has reduced the total export demand, though it has increased the need for shipments to Great Britain. What they fail to see is the fact that our National Defense Program, with the stimulation that it gives to consumer buying power, swells the demand for precisely the goods that we must export to our friends in the struggle for human freedom. Without a tremendous jump in the output there would be nothing left to accompany the guns and planes that we send abroad. Fortunately the leaders of agriculture in every county throughout the country have grasped the matter and brought their total energy to bear on agriculture's task.

Two years ago, when the war began, our farmers saw little need to expand their output. They were as convinced then as they are today that totalitarianism is a world threat. Every poll of agricultural opinion bore witness to the fact. It did not seem, however, that farmers could help much with a food drive. At that time

Europe had not been engulfed in the Nazi tide, and the British seemed fully able to draw on their accustomed sources.

In the United States we had surpluses of cotton, wheat, corn, and tobacco, with small chance to export them. There were few shortages of any agricultural products. In the first 12 months of the war our exports of tobaccos, fruits, and grains were in each instance about 30 percent less than in the preceding 12 months. Exports of pork were about 40 percent below the 10-year average. Exports of raw cotton and linters dropped sharply in 1940.

Our own defense program had barely started; there was still considerable unemployment in the United States. In this setting the forecast was for a smaller rather than a larger demand for agricultural products, and from a production standpoint agriculture prepared to mark time.

## Sudden New Call on Agriculture

Suddenly the outlook changed. Germany swept over Scandinavia, the Netherlands, Belgium, and France. Great Britain had to get more of its food supply from overseas. Our National Defense Program stimulated consumption here. Our foreign policy established a clear identity of interest between the United States and Great Britain in the resistance to aggression and led to the passage of the Lend-Lease Act. It became at once apparent that agriculture's defense task would be exactly on all fours with that of industry and labor; in other words, it would call for a quick and substantial boost in production. The farm task had another vital resemblance to the industrial task. It required not a general but a selective increase in production; not a blanket rise in the output of everything grown on the farms but an increase in some things, along with a decrease in others. There was need, in short, for an organized and coordinated farm program, with the emphasis changed from that of the pre-war years but with long-time agricultural values still kept firmly in view.

It will be appropriate in this report to describe the results in some detail. Broadly the response in 1941 to the call for greater farm production was favorable and gave a record output, though it left a need for still larger increases in 1942.

This Department saw what was coming and prepared to meet it. One early sign was the effect of the National Defense Program on employment and on consumer buying power, which foreshadowed a quick and steep rise in the demand for farm products. Apparently the farmers were not expecting that. For example, in December 1940 they reported hog-breeding plans that indicated a 1941 spring pig crop about 14 percent smaller than that of 1940, though the 1940 crop had been relatively small. In a statement issued on December 26, 1940, the Department said farmers could increase their income by increasing their hog production above the indicated level. It added that a spring pig crop at least no smaller than that of 1940 would be desirable. Though the farm price of hogs was then only about $6 a hundred pounds, hog producers acted on the Department's suggestion and raised a spring pig crop about equal to that of the previous year. Moreover, they laid plans for a big increase in the breeding of sows for fall farrowing. How well the Department gaged the pros-

pect may be judged from the fact that the farm price of hogs is now nearly $11 a hundred pounds.

In like manner the Department urged an increase in marketings of cattle and calves for slaughter in 1941. It made this suggestion too on December 26, 1940. The outlook then was for smaller market supplies of meat in 1941 than in 1940 and at the same time for a marked increase in the demand. There was a prospect, however, that within a few years the number of cattle and calves on farms and ranches would be extremely large. Hence the Department urged farmers and ranchers to increase their marketings at once as much as possible, with the double purpose of satisfying defense needs and obviating future overproduction. As it turned out, the total marketings of livestock and meat products in 1941 were about the same as the record total of 1940, and the stage was set for increased marketings in 1942. Farm cash income from meat animals in 1941 was one of the largest totals in the last 20 years.

There was early recognition in the Department that dairy production would need to be stepped up greatly. The Department advised the farmers to this effect in a general way months before lend-lease requirements became known. Our defense program was still in an early stage; but the tremendous scope of it, with the growing prospect that Great Britain might have to obtain more dairy products, meat, and eggs from the United States, pointed to a prolonged strengthening of the farmers' market. It was evident that in one way or another the war and our defense program would necessitate a revision of our farm-production program, with the need paramount to expand the output in some lines while holding it steady or reducing it in others. In the fall outlook report of 1940, in the Report of the Secretary for the same year, and in press releases and other statements the Department endeavored to bring knowledge of these facts home to all the farmers.

## Situation Early in 1941

Early in 1941 the situation became clearer. Passage of the lend-lease bill was near; members of the British Purchasing Commission were conferring with representatives of the Department on probable British requirements. In broad outline the supply program took shape, definitely enough to warrant tentative commitments. Preliminary study, while the lend-lease bill was still pending, prepared the Department to act the day the bill became law. As soon as that occurred the Department began to make purchases and ship commodities to the docks, with funds made available by the Commodity Credit Corporation in anticipation of disbursements from the lend-lease appropriations. This promptness saved priceless time. Farmers had to consider the seasons and to prepare ahead for livestock and poultry raising. Delay in the spring of 1941 would have meant, in some lines, the loss of a full production year.

Thus launched on the food-for-freedom drive, the Department began to plan for the longer pull. On April 3 it announced a plan to support the prices of dairy products, hogs, chickens, and eggs up to June 30, 1943, and to cushion the possible shocks of the post-defense period. It defined the probable requirements more precisely.

In dairying, for example, it called for an increase of production of from 6 to 8 percent, and specially emphasized the need for more cheese, evaporated milk, and dried skim milk. It established price differentials calculated to promote the desired balance among dairy products. It offered encouragements to more production of white beans, tomatoes, and other products. Later the Department said it would endeavor to support the prices of hogs, eggs, evaporated milk, dry skim milk, cheese, and chickens, at not less than 85 percent of parity until December 31, 1942, as far as the available funds permitted.

There was action also in Congress to fit agriculture better for its defense task. Export of basic crops is more difficult than it was before the war, and the surpluses of wheat, cotton, and tobacco are large. As a means of supporting the prices of basic crops, and at the same time of improving the adjustment of them to the market, Congress passed legislation (Public Law 74, approved May 26, 1941) to make loans available on 1941 cotton, corn, wheat, rice, and tobacco at 85 percent of parity, provided marketing quotas for these crops have not been disapproved. The same legislation redefined marketing quotas for wheat and corn and increased the excess corn and wheat marketing penalty to 50 percent of the basic loan rate for AAA cooperators. Another measure (Pubic Law 147, approved July 1, 1941) extended the life of the Commodity Credit Corporation, increased its financial resources, and directed the Secretary of Agriculture whenever he finds it necessary to encourage the production of nonbasic crops to support the prices thereof at not less than 85 percent of parity and to give advance notice should a downward adjustment be necessary later.

## Administrative Changes for Defense

Another big defense development was in the field of agricultural administration. In a letter to the Secretary on May 5 the President requested the creation of an Office of Agricultural Defense Relations within the Office of the Secretary. Previously, agriculture's direct representation in the national defense organization had consisted of one place in the National Defense Advisory Commission. The new unit, which came into existence immediately, reflected more adequately the fact that agriculture had major defense responsibilities and also difficult defense problems. It does not supersede any of the existing agencies in the Department but acts rather in a planning, advisory, and liaison capacity. Part of its job is to study what agriculture needs in its defense task, particularly its needs for labor, fertilizer, machinery, chemicals, and storage facilities, and to present these needs to priorities officials. Some of the things required may soon be scarce. As a further step in the defense organization of agriculture the Secretary in July established USDA defense boards in every State and county, with the special duty of getting the full cooperation of the Department's field personnel in all defense undertakings. In August, at the suggestion of the President, the Secretary appointed a committee of farm-organization leaders to cooperate in defense work with the official agricultural agencies.

Membership of the USDA defense boards includes a representative of each agency of this Department that has defense responsibilities. The chairman of each State board is the head officer in the State for the Agricultural Adjustment Administration. The chairman of each county board is the chairman of the county AAA committee. This reflects the fact that helping farmers to make adjustments in their production, upward in some crops and downward in others, is the Department's main defense task. The State defense boards report to the Secretary; the county boards report to the State boards. Specifically, the duty of the boards is to promote maximum cooperation of the Department's field personnel in all defense undertakings and to cooperate with other defense agencies that have State and local offices. From time to time the Secretary gives them special assignments. In the Southern and Eastern States, for example, he asked them in late summer to encourage greater use of winter cover crops as a partial offset to the prospective shortage of nitrogenous fertilizer. Such crops put nitrogen from the air into the soil. The Secretary has asked the boards everywhere to make an estimate of farm-machinery needs, as a basis for requests by the Office of Agricultural Defense Relations for priorities for raw materials for farm machinery. He has also asked them to inform farmers of the necessity of repairing existing machinery and to urge farmers to sell the scrap steel so that new steel production may be sustained.

## Working Out Goals for 1942

In July and August the Department worked out production goals for 1942, in September got the help of State agencies in breaking them down on a State and county basis, and in October, through the AAA organization in every county, started a pledge canvass among farmers in all parts of the country. The determination of the goals was a tremendously complicated job, which the goals committee nevertheless did sooner than anyone had thought possible. Among the factors that had to be considered were the probable demand at home and abroad; the probable need for machinery, fertilizer, insecticides, container materials, and agricultural labor; the seasonal and biological obstacles to rapid crop expansion; nutrition requirements in the United States; transportation and storage problems; and the credit facilities available to farmers for increasing their production. It was necessary also to develop new uses for land excessively in staple export crops temporarily without an export market.

Next came the task of getting the goals translated into farm action. This called for the active cooperation of State agricultural agencies. The facts which proved that the goals were necessary and practicable and that attempts to fulfill them would have continued public support had to be given to the farmers. What the Government had promised in the way of price support had to be made clear. Everything possible had to be done to assure necessary supplies of labor, fertilizer, machinery, and chemicals and to guard against the risk that things produced might lack adequate storage or transportation. Priorities in industry had their counterpart in agriculture; surveys were necessary to work them out and assure the best total use of the supplies

available. The goals program started with a well-organized and very productive agriculture; but it needed the backing of careful planning, consistent, sustained action, and complex coordination throughout the agricultural industry.

Such a program would not have been possible had agriculture entered the war period unorganized and without any national machinery for coordinating its activities. In that position it would have been able to make only a blind response to the needs of the emergency—the kind of response it made during World War I. As matters stand, with agriculture organized nationally through AAA programs and with the Department authorized to help farmers to guide the war-time crop adjustment through the use of special prices and definite acreage and marketing controls, they can meet the precise requirements with an economy of effort hitherto unapproached.

In the period between World War I and World War II agriculture was in an impassé. There was not scope enough for its growing productivity. With its foreign market cut in half and its market at home depressed, it faced a choice of evils; production at a loss or production with the brakes on, against its whole natural tendency. Accordingly, it developed a control system. Its first use was in crop limitation, but the system was capable also of fostering crop expansion. Now comes the test of it in the latter capacity, in a world crisis in which food will surely grow to be of more and more importance, not only in the United States but in countries that need our help against oppression. The impassé exists no more.

## Scope of the Goals

In proper composition, with defense requirements emphasized and nondefense requirements scaled, the output of the farms cannot grow too big. Even yet our estimates may be too low. Indeed the farm output will not be too big after the defense emergency is over if we keep the crop adjustment flexible and hold crops in proper balance through skillful advance planning. Less than a year ago we could not have believed this. But we realize now that foods are munitions and that we are likely to need them in record quantities for an indefinite time. The set-up that agriculture has developed for doing its defense job has a responsible place and a definite assignment in it for every producer and also supplies a liaison between farmers and official agencies both Federal and State which will add enormously to the effectiveness of public agricultural research and service.

War shifts the emphasis that we place on different major aspects of the national farm program For example, the defense program results in a wider market for numerous farm products. More people are back at work, and the increase in consumer income means an improved demand for farm products. Fewer people are now dependent on receiving supplementary supplies of foodstuffs through relief agencies and through the stamp plan. With improved markets for many agricultural commodities and increased farm earnings, many in the higher level of rural rehabilitation borrowers will be able to repay or substantially reduce their debts.

But the war and the defense program do not, even for the present, entirely solve the problem of low consumption in the cities and the related need for wider markets for farm products. They do not cure the problem of low incomes for many families on the farms. It is consequently highly important to maintain our programs for commodity distribution and rural rehabilitation. The need for assisting low-income families in both town and country, helping distressed farm people through loans and farm and home guidance, and assisting in developing the skills required in modern farm production continues during the defense emergency. We must not slacken our effort to see that all our people are kept healthy and properly nourished.

Unemployment and underemployment still exist in both town and country. Shifts required under the defense program are causing difficulty among groups of urban workers. Many of these shifts also have a bad effect on agriculture. It is true that with the current improvement in farm incomes and in wage opportunities many more farm families on a low income level can now be reached and helped. They are in a better position to qualify for rehabilitation loans. Nevertheless more than a million farm families are still in need of special help. Many farm families have not shared in the defense prosperity or have actually been displaced by it. The problems of these families and the problems of urban families that are still in difficulty call for continued attention.

Our programs for food distribution and for rural rehabilitation should of course be flexible. Current use of these programs should match the current need. They continue to be essential, however, for many who are not yet sharing in the new defense income and to relieve the shock of emergency economic readjustments. There will perhaps be increased need for these programs when the time comes to shift from defense to peace production.

Plans for doing this job are in hand. The tools, however, must be ready. Peace may come suddenly and find us unprepared; or it may find us prepared and yet unable to carry our plans into effect with sufficient speed. Measures for commodity distribution and rural-security measures will be important instruments in the transition. The machinery needs to be used at present and to be kept intact, well-oiled, and operative for needs to come.

In resources and in means of using them effectively in the defense task our agriculture has a rich endowment. Agricultural science, as developed in this Department and in the State agricultural agencies, is available to every farmer in proper combinations of physical, biological, and economic facts. Marketing services exist to grade commodities, inspect shipments, and prevent harmful speculation and dishonesty. Management of the Ever-Normal Granary moves feed from areas of surplus to areas of shortage and withholds surpluses temporarily for use later. Surveys of demand indicate what the farms should produce; surveys of farm needs help to obviate shortages in the tools of production or to distribute supplies advantageously if shortages arise. Substantive law, as embodied in numerous enactments, provides facilities for regulating both supplies and prices and for smoothing the transition from war to peace when defense has done its job.

## Production Goals for 1942

Attainment of the 1942 goals, which the Department announced in September, will mean an agricultural production even higher than the record production of this year. Specifically, the 1942 production will be 115 percent of the 1924–29 level, as compared with 105 percent in 1936–40 and an estimated 113 percent in 1941. It will be possible, with production at this level, to maintain and in some lines even to increase the average per capita consumption of foodstuffs and other agricultural products in the United States and at the same time to provide large quantities for shipment abroad. Foreign shipments equivalent to the production of more than 25 million acres will be feasible. In addition we shall be able to maintain reserves of feedstuffs and other products in amounts sufficient to allow for further increases in foreign trade and also to give us protection against drought.

Besides the estimates of needs here and of needs for commercial and lend-lease export, the department's goals committee figured what quantities should be set aside to begin building up a reserve of foods, especially of finished foods like canned pork, evaporated milk, canned vegetables, and dried eggs. Combined requirements for consumption in the United States, for lend-lease shipments plus expected commercial shipments, and for beginning the reserve stock with proper allowance for supplies in hand, indicated the objective broadly. Then came the break-down by commodities. It was necessary as well to take into account the available labor supply, the supply of machinery, the supply of material, the market outlook, and the funds available for supporting farm-commodity prices. Facilities, as well as objectives, had to be appraised. Necessarily, the resultant goals were a compromise between the ideal and the attainable. Nevertheless, the ideal and the practical did not diverge widely in the goals.

In addition to the factors mentioned, it was necessary to consider the import situation. As yet our imports have not suffered greatly from the ocean shipping shortage; nevertheless curtailment of many imports is in prospect, particularly of certain fats and oils. Hence the goals call for increases in our own fats and oils production.

## Goals Within Practicable Limits

Another factor considered was the table of dietary standards recommended by the National Research Council. It raised the calculation for consumption in the United States above what it would have been had the goals committee considered only the expected consumer buying power. Nevertheless the goals do not call immediately for production sufficient to give everyone an ideal diet. There is too serious a lack of domestic income in certain groups and areas and also a want of general knowledge as to what good nutrition requires; and the food habits of many people keep them from eating what they should, even though they have the knowledge and the income. But the goals look toward better nutrition; in fact they make better provision for it than we have ever had before.

In some lines, for example in certain fruits and vegetables, the emphasis is largely on the elimination of waste and the improvement

of marketing. There is a call for some increase in the production of commercial vegetables. In the case of some animal products the limitations of breeding and growth affect the goals. It would be possible, for example, to make good use of more hog products than we are likely to have in the first half of 1942. Production of eggs, however, is likely to be sufficient when the young chickens hatched this year begin laying. Milk production, though higher this year than ever before and likely to be still higher in 1942, will not fully satisfy both lend-lease requirements and optimum domestic consumption. In wheat and cotton the aim is still some reduction in the output; acreage allotments for corn and tobacco remain practically unchanged. In some of the lines in which increased production is desirable the goals are somewhat below what we should like to produce. They are high nevertheless in view of the knowledge that labor may be short in some sections and that fertilizer and farm machinery may not be easy to get. In no case do they exceed what the Department regards as practical; yet they provide generously for expected lend-lease exports and also for record-high domestic consumption.

Our farmers are already increasing their production of foodstuffs needed for domestic consumption and foreign shipment. Further increases are desired or are in prospect for 1942 for milk, pork and lard, eggs and chickens, soybeans for beans, and peanuts for oil. Production of flaxseed and of dry beans will probably continue at the current high level. Some further increases will be obtained in lamb and mutton, rice, vegetables, and potatoes. There will probably be no effective limitation of domestic sugarcane and sugar-beet production in 1942. It may be necessary, when more definite data become available on the current vegetable crops, to revise the goals that have been set for these. Changes in the ocean shipping situation may necessitate revision of the estimated requirements for sugar, soybeans for seed, and peanuts for oil.

With beef cattle, as explained in this report, the problem is one of marketing rather than of production. The number of beef cattle on farms and ranches in January 1942 will be at or near an all-time high. It will be desirable to have increased marketings of beef animals for slaughter in 1942, so that the number on farms and ranches will not increase excessively. In some regions the present number is excessive for the range carrying capacity.

The suggested feed-grain and hay acreages are adequate to supply feed for a somewhat greater production of milk and of pork and lard and about the same production of eggs and chickens and beef as that indicated for 1942. Sufficient carry-overs are provided in addition to give protection against drought. In the event of a severe drought surplus wheat would be available for livestock feeding. It might be practicable to use as much as 200 million bushels for that purpose. Most of the feed for milk cows, chickens, and meat animals in 1942 will be obtained of course from the crops of 1941. Crops harvested in 1942 will feed the animals that will be available for marketing in 1943.

In cotton, wheat, and tobacco the acreage goals suggested for 1942 are in each case somewhat lower than or only equal to the acreages harvested this year. These are the chief export crops in

normal times. The reserve stocks on hand are more than adequate. Some classes of cotton which fill special needs are not included in the allotment and marketing quota program. The Department has suggested that the acreage of American-Egyptian cotton in 1942 should be about the same as it was in 1941 and that the acreage of sea island cotton should be further increased. It should be noted that the acreage goals for cotton, wheat, and tobacco must agree with the provisions of the Agricultural Adjustment Act of 1938 as amended. The minimum allotment for cotton is 27½ million acres; it is usually underplanted about 12 percent. In wheat the minimum allotment is 55 million acres. In tobacco the allotment depends on the requirements of the quota system.

The 1942 production-goals campaign provides for a complete mobilization of our agriculture under the supervision of State and county USDA defense boards made up of representatives of all the Department's field agencies. Machinery of the national farm program will be applied practically to the whole range of agricultural commodities, with three main ends in view: (1) To provide an abundance of everything for which there is an increased need; (2) to maintain checks on the production of crops that we have available in excessive quantities; and (3) to avoid a repetition of the mistakes made during World War 1. The call for increased production in some lines does not mean that the lid is off all branches of farm production, or that getting what we need will require us to plow up hills and plains with no regard to conservation. In fact it may not be necessary materially to increase the total crop acreage. Our farm production generally is in fair balance, and the drive for more hogs, eggs, evaporated milk, dry skim milk, cheese, and chickens will tend to make the balance still better, rather than to throw it off.

It is necessary to translate the needs for production in 1942 into practicable goals for individual farms. More than 6 million farmers the country over are being asked individually to set down their production plans for 1942. This is not merely a "sign-up" campaign. In every case the individual farmer will have available the counsel of agricultural technicians informed as to local farm practices and conditions—counsellors capable of advising with farmers as to the adjustments which may be needed in contributing to the national production goals of 1942. Available to farmers also are the long-time adjustment recommendations based upon careful research and analysis by the Bureau of Agricultural Economics, as well as the records of agricultural action agencies cooperating in the agricultural planning programs.

The job of 1942 production will not even be well started until national goals are broken down into practicable jobs for every farmer in the country. Sign-ups must be reconsidered in terms of the best contribution to goals that can be made from the productive resources of each farm. Some farms cannot expand, and their share of the defense effort will be to hold production at present levels. Better situated farms must carry the load.

Paramount is the need for meeting the 1942 production goals without endangering the physical resources of any farm. The Nation cannot afford to have the agricultural conservation gains of the past

10 years dissipated, if for no other reason than that there is every likelihood that unusual production efforts will need to be continued in 1943. Moreover, the 1942 goals can be achieved without repetition of the disastrous exploitation of World War I, when land was indiscriminately plowed up.

## Needs of Great Britain

Great Britain expects to get from this country about one-fourth of what it needs in animal-protein foods. All told, British needs for United States farm products may amount to nearly 6 or 7 percent of our total farm production. Our total exports in 1942, the ordinary commercial business plus the lend-lease shipments, may absorb as much as 8 percent of the total and may require the output of 25 to 27 million acres of cropland. Our total production in 1942, if we reach the goals, will be only about 2 percent greater than this year's, but the percentage increase in products needed for lend-lease export will be much greater. Specially needed in Great Britain are the rich concentrated foods, such as meat, eggs, and cheese, which pack much nourishment in little space. More than any other item the British workers want meat. It has been said that with an ample supply of meat they could increase their factory output 15 percent or more. They could turn more meat into more guns.

Everyone in Britain can get all the bread or potatoes he wants. But his ration card will get him only a very small allowance of meat, cheese, eggs, butter, and lard. The level of nutrition in Great Britain before the war was lower than that of the United States. It is at a still lower level now. All the milk produced in England goes to babies, young children, and nursing mothers. Coal workers and farm workers get a larger food ration than other people; but no one gets a liberal diet. In the years before the war Great Britain imported almost two-thirds of its food supply; it obtained quantities of butter, cheese, and pork from continental Europe. It has to turn for such foods now to more distant sources, among them the United States. It has to reduce its poultry and hog numbers, because ships must carry other things than feed grain. It has to plow up its world-famed pastures and seed them to grain or vegetables. Such expedients, however, do not remove the shortage, and our lend-lease shipments are a matter of life and death.

Up to October 1 nearly 1,650,000,000 pounds of agricultural commodities had been delivered to representatives of the British Government for shipment under the provisions of the Lend-Lease Act. The total cost of the commodities was nearly $200,000,000. Animal protein products made up the most important groups of commodities in the shipments. These included cheese, dried milk, evaporated milk, eggs, and pork and lard. Other commodities made available to the British included fruits and vegetables, grain and cereal products, fats and oils, other foodstuffs, and such nonfoodstuffs as cotton, tobacco, and naval stores. Most of the food supplies are distributed to the civilian population in England through normal trade channels, under a rationing system and with strict price controls. Some of the supplies are distributed through canteens in industrial plants; some are used for free distribution through mobile soup kitchens in bombed

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areas, and some are given to children and others through schools, clinics, and hospitals.

The 7-billion-dollar lend-lease appropriation included 1,350 million dollars earmarked for agricultural and other commodities. Under new lend-lease legislation (Public Law 282—77th Cong. approved Oct. 28, 1941) the Congress has appropriated an additional 1,875 million dollars for the purchase of agricultural and industrial commodities. Great Britain's requirements, along with other foreign demand, will call for about twice as large a volume of agricultural exports from the United States as it exported in 1941. As compared with normal exports, however, the volume will still be low.

It would be a formidable job to meet the call even if the demand in the United States remained unchanged. But the demand here is advancing, as of course is desirable for the sake of better national nutrition. Our national income for 1941 will be not far short of 90 billion dollars—up around 14 billions over the level of 1940. It will surely rise to more than 100 billions in 1942; and though taxes also will be higher, consumers will have more money income left than they had in the predepression year 1929. There is a notably rapid increase in the income of industrial wage earners. Wages and pay rolls have advanced sharply, and on the other hand the rise in living costs so far has been moderate. Meeting both the increased domestic need and the lend-lease commitment demands unprecedented agricultural effort, not so much on account of the net crop increase desired, which is small, but because the task involves great changes in the commodity balance. Thus it demands for Great Britain large quantities of commodities that ordinarily we do not produce above our own requirements and some crops besides that frequently we import in large amounts. We want a 10.5-percent increase in the production of meat and poultry, a 10-percent increase in egg production over this year's high figure, and a 7-percent increase in milk production over the record 1941 supply. In responding, agriculture will also fight the inflation danger.

## Reserves as Defense Aids

Besides providing for adequate nutrition here and for lend-lease exports, the goals for 1942 look toward a reserve of foods over and above the normal carry-over. In wheat, cotton, and tobacco we have reserves already; but we need a reserve of finished foods like canned pork, canned vegetables, dried eggs, and evaporated milk. These are things that will keep. We need the extra supplies to make sure that our own people will have plenty to provide food for the people of England, China, and the other countries that are actively resisting aggression, and to give the starving conquered peoples of Europe something to depend on when the fighting stops and something to encourage them meantime in their fight against oppression. Moreover, reserves are a propaganda weapon. If we have food ready to pour into the occupied countries, and even into Germany as soon as the battle for democracy has been won, Hitler's strength will crumble sooner. Food will win the war and write the peace. When the time comes to sit at the peace table the existence here of a great reserve of food will reinforce our views as to what the peace should be.

To foresee exactly the food requirements is of course impossible. Similarly we do not know exactly how many guns, planes, tanks, and ships we shall need. In both branches of our defense effort prudence demands liberal rather than niggardly estimates. The only real limitation, which we cannot measure, is the quantity necessary to make sure that we shall not have to live in a world dominated by Hitler. It is possible that the war will end sooner than we now expect and that we shall then have to readjust our agricultural program to post-defense demands. Meantime, the defense job sets the goals. They add up to more food than we have ever raised before. The thing to keep in the foreground now is the equal importance of foods and munitions in defense. Agriculture's job is to provide plenty of rich, nourishing food for the industrial workers both of the United States and of Great Britain—food that will assure the efficiency of their air forces and their armies and navies.

Many farmers remember the surpluses that followed World War I and fear a similar aftermath again. In vital respects, however, the situation is different now. In the first place, the danger to our Nation is greater. If Germany wins, it will either throttle our export trade altogether or will take our goods merely as preparation for an attack upon us. There can be no lasting peace. In the second place, our farm program, forged out of the problems left by the last World War, is strong enough to meet the strains of the new post-war period, and to keep the production program well in hand. More important still, victory for democracy will postpone the need for readjustments downward in our farm production. It will give us a transition market and will facilitate gradual changes toward a peacetime basis.

There cannot be much doubt about that. With the Hitler menace gone, Europe will face another menace—that of hunger. Elsewhere in this report is an account of Europe's present food situation. It shows that when the war stops there will be a tremendous need in Europe for grains, feeds, fibers, dairy products, meats, and breeding stock for flocks and herds. Somehow the need will have to be anticipated and eventually met, on pain of loosing new forces of destruction. It will pay the United States to help, if we have assurance that the result will be a long peace rather than new civil or international war. Under our lend-lease program now we are providing foods and munitions to repel aggression. The same logic will suggest the use of food to guard against a repetition of the danger of revolutionary upheavals in Europe. Payment may not be immediately in goods or gold. It may be simply collaboration in world healing. As such, it might be highly acceptable.

## Post-War Use of Reserves

Continuation of our exports to Europe even on a gift basis would be a worthwhile investment for us if it helped to stabilize the world. It would lighten the burden of armaments and give us a chance to replenish our peace goods. Our surplus cotton, wheat, and tobacco would come in handy, as well as what we could spare of our livestock and dairy production. Our return might not be in material things at all; it might consist rather of new and better arrangements in world

politics, of safeguards against new wars, and of world partnerships against disease and poverty and against social injustice and discontent. It might lay a foundation for cooperative and constructive international-trade relationships hereafter. In contrast with the alternative of further distress and disturbance in Europe this type of payment for our exports would be priceless. In a transition period, with ordinary trade still difficult or largely impossible, it would be far better than economic isolation.

This of course assumes the defeat of Hitler. Anything less, however, poses a farm task for us that would be more difficult still. In a Hitler-dominated world there would be no safe export outlet whatsoever for United States products. Every pound of cotton and every bushel of wheat that left our shores would come back to us eventually transformed into bombs and guns and armies. The exports would generate literally a hellish kind of imports. There would be no chance whatever for normal international trade; potentially, and very soon actually, we should be beleaguered. Against the risk of that, the anticipation of a post-war trans-Atlantic trade maintained on substantially a credit basis for a while is a minor worry. It may not prove to be a worry at all if it helps to bind the hemispheres together in friendship.

## Government's Role in Farmer's Present Market

Actually our post-war problem will be more domestic than foreign. It will turn chiefly on the success we have in shifting over from wartime to peacetime manufacturing. Agriculture's market now is abnormal. Largely, the Government is the mainstay for present demands through the payments it makes not only to farmers but to defense industries and consequently to wage earners. As noted, the food campaign in 1942 may turn about 6 or 7 percent of our farm production over to Great Britain. It will reserve most of the rest for consumption or storage here. Exactly what the Government contributes, directly and indirectly, to the farmer's market we do not know. Undoubtedly, however, any quick withdrawal of it would cause a great depression both for farmers and city industry. What the Government pays to industry on defense contracts is perhaps more important to agriculture just now than what it pays to farmers directly or through commodity loans. The big post-war problem will be to maintain this support of domestic buying power or to find an equivalent. If we cannot do that, what we might do to help agriculture much through foreign trade would be weak in comparison.

We have to keep things in the right order. Our food-for-defense drive aims to feed England as well as the United States. It does not imply that foreign trade is more important than domestic trade for agriculture. On the contrary, our first care must always be to sustain the level of domestic buying power. That is the way to eliminate agriculture's worst hazard. It will be relatively easy to move from that point on to a settlement of the export problem, which in any case is not nearly as important as it was formerly in determining the production and the income of our farmers. In the future we may have to depend still more on domestic solutions of our agricultural problem. There is no known way to have a big export trade permanently without

a corresponding import trade. Whether or not, after defense, we shall be prepared to take greatly increased imports in order to keep up a high level of exports remains to be seen. In any event exports are relatively so unimportant for most products that even with Hitler gone we shall have to base our farm prosperity mainly on the domestic market.

Fortunately the farm production drive looks in that direction. In contrast with the food campaign in the last war it does not emphasize grain but rather the commodities that we can use in greater quantities ourselves. It provides the wherewithal to improve the nutrition of the country rather than merely to fill its storehouses. If the need for overseas shipments should decline after the war, the production developed to meet it will not be wasted; nor will it have to be stored indefinitely until the export demand revives. It can be consumed currently in the United States, preferably through normal buying based on well-maintained employment. Quantities can be released in addition for the undernourished groups in our population. In fact, the lend-lease program has been planned with possible adjustments of that sort in view, especially in connection with milk and milk products. In other words, the wartime food program changes the composition of the agricultural output in the direction in which we need to change it, in view both of our domestic requirements and of the long-time prospects for our export trade. There are some particular products, such as dried eggs and navy beans, where peace may require readjustment, but for the major products, with domestic consumer buying power adequately sustained, the farm program will fit quite well into the post-war situation.

## Ocean-Shipping Shortages

In spite of shipping difficulties, such as the use of merchant vessels by British and United States Naval and Military Establishments, unbalanced traffic on some routes, and the destruction of ocean tonnage, our imports have increased on a quantity basis. In only a few instances have our stocks of critical imported materials declined. Our imports of wool, rubber, hides, tin, cocoa, and sugar are substantially above normal. So far the stocks of these commodities have shown no tendency to decline. Flaxseed imports amounted to about 200,000 tons in the first half of 1941, or the amount estimated by the Department to be needed for the entire calendar year 1941.

In the first 22 months of the war (up to June 30, 1941) the Axis powers destroyed 7,118,122 tons gross of the vessels at the disposal of British, Allied, and neutral countries. On the other hand, new construction, seizures of German, Italian, French, and Danish tonnage, the use of shipping previously laid up, and the diversion of coastwise tonnage to foreign trades, replaced a large part of the tonnage lost. Moreover, the blockade of Europe released many vessels to other regions.

As of January 1, 1941, Great Britain still owned or controlled almost 24 million tons gross of ocean-going vessels; Japan owned or controlled 4½ million tons, and Russia and Spain about 1½ million tons. Other countries, excluding the United States, owned or controlled about 5 million tons. The United States controlled about 7 million

tons of ocean-going shipping of about 545 million cubic feet of shipping space—two-thirds of it operated in the coastwise trades. Tankers, which cannot transport dry cargoes, comprised nearly one-third of the total United States deep-sea tonnage. In 1940, however, we required about 2 billion cubic feet of vessel space to carry our more important imports.

The United States has not enough shipping space of its own to take care of its import trade, even with a considerable diversion of tonnage from domestic to foreign commerce. Furthermore, the Maritime Commission cannot take all ships from the domestic trade and turn their work over to land transportation agencies. These too have a wartime problem. They have to carry a much larger traffic than usual due to national defense and increased consumer demands. That they can handle in addition all the traffic usually carried by coastwise carriers seems impossible. So far, nevertheless, the situation has not been serious.

Accurate forecasts of the ability of the shipping industry to transport all the imports required by our industry and our naval and military establishments are impossible. The ocean-shipping situation has too many variables. No one can guess the trend in sinkings, which was serious in the March to May 1941 period, but comparatively mild in June and July 1941. No one can know definitely how much tonnage will be required by the armies and navies of the United States, Great Britain, and Japan. The requirement may increase suddenly. As the supply of commercial shipping declines through the demands of the world's armies and navies and through sinkings by the Axis powers, we shall have more trouble in obtaining the imports that we need.

It is worth repeating, however, that widespread pessimistic forecasts have not as yet come true. The Department of Commerce has constantly reported a sharply rising trend in the quantity of our imports for the past 12 months. Furthermore, our emergency shipbuilding program should reach a point in a few months where the amount of tonnage it produces, together with that built by Great Britain, will almost equal the losses that have been incurred plus the losses that may be incurred in the remaining weeks of this year. If a decrease comes in our imports, it will not be sharp unless unforeseen conditions arise. There is a distinct possibility under present conditions that imports will continue to be brought in at the present level.

As a partial offset to ship destruction, the President's proclamation of an unlimited emergency cleared the way for the control of United States shipping. It indicated the possibility of a control of rates without regard to whether or not such control could have been exercised under existing legislation. It gave hope too that the maladjustment of the shipping supply on various routes and the associated maladjustment of rates could be corrected or greatly lessened. Needless to say, the situation is full of "unpredictables," especially in connection with the foreign policy of the United States Government. Entrance of this country into the war or new curbs on our trade with the Orient would have great effects on the supply of water transportation.

## Impending Shortage of Fats and Oils

The United States faces a shortage of fats and oils, which the expected increase in lard production in 1942 will not offset. It imports normally from 10 to 15 percent of its total annual supply of fats. Scarcity of shipping cuts down the trade.

Our imports of fats and oils consist chiefly of tropical and semitropical products that cannot be produced successfully in the United States or can be produced at a lower cost in other countries. The more important items are coconut oil and copra, palm oil, palm kernels, babassu nuts, flaxseed, castor-beans, tung oil, perilla oil, fish-liver oils, sulfured olive oil, and rape oil. They are important in soapmaking, in making paints and varnishes, in the tin-plate and terneplate industry, as sources of vitamins, and in other ways.

In terms of crude oil our imports of fats, oils, and oilseeds during the first 5 months of 1941 were 11 percent smaller than in the first 5 months of 1940. The decline occurred in spite of a stronger demand and higher prices. Withdrawal of some British vessels from American service and the diversion of other vessels to uses considered more immediately important were factors in the situation. As noted, they may be further reductions in ocean-shipping space. It is possible to substitute domestic products in some of the uses for which we depend normally on imported fats and oils, though serious curtailment of the imports will almost unavoidably mean deficits in the total supply. Hence, the Department recommends expanded domestic production.

## Substitutes for Imported Oils

Some of the imported oilseeds such as copra and babassu nuts contain lauric and other acids that import quick-lathering properties to soap. There is no adequate domestic substitute. Domestic rosin could be used to produce easily soluble soaps; but they would be markedly inferior to similar soaps made with lauric acid oils. Soybean oil and other domestic oils could be substituted for imported oils in making food products. Domestic fats and oils could be substituted readily for palm oil in food products and most soaps. Possibly certain fractions of soybean oil could be used to replace palm oil for dipping hot tin and terne plates. In the drying-oil field it would be possible to use domestically produced linseed, soybean, fish oils, and castor oil to meet most of the deficiencies that might arise from a reduction in the imports of flaxseed, tung oil, perilla oil, and castor-beans.

Our production of fish-liver oils could be increased to offset partly the reduction in our imports of such oils; it would also be possible to utilize the less potent fish-body oils for their vitamin content. Replacements probably could be found for special-purpose oils like sulfured olive oil and rape oil, which have important industrial uses. It might be desirable, however, to produce some rape seed domestically, since blown rape oil is highly resistant to the action of salt air and water and consequently valuable as a lubricant for marine reciprocating engines.

## Program for United States Fats and Oils

Specifically, the Department has recommended that steps should be taken: (1) To increase the domestic production of soybeans for crushing; (2) to obtain a supply of castor-beans suitable for planting and to encourage the production of seed from it if castor-beans cannot be imported from Brazil and India in sufficient quantity; and (3) to increase the production of flaxseed in the United States if lack of shipping space reduces seriously imports from Argentina and Uruguay.

Probably the total deficit in fats and oils will be met only in small part this year. Possibly 400 million pounds will have to be withdrawn from stocks. Fortunately our stocks of fats and oils on January 1 last were large. They amounted to about 2.5 billion pounds, or approximately one-fourth of a year's requirements.

In June the Department announced an emergency castor-bean seed-production program designed to furnish this country with a supply of adapted seed stocks should defense developments make it expedient to increase domestic castor-oil production in 1942. The program will be limited to 11 counties in the blackland area north and south of Dallas, Tex., and will be carried out in cooperation with the Texas Power and Light Co., which has most of the available seed stocks.

Farmers who cooperate in the Agricultural Adjustment Administration program in the 11 Texas counties will be offered 3½ cents a pound for cleaned seed and will be exempted from deductions from their 1941 agricultural conservation program payments for excess soil-depleting acreage equal to 5 acres or 5 percent of the cropland, whichever is the greater, where the excess is due to the planting of castor-beans.

This is strictly a defense measure made advisable by the possibility of the lack of shipping to bring in our normal requirements of tung oil from China and castor-beans from Brazil and India.

So long as we can import our castor-bean needs there will be no need to produce castor-beans in this country on a commercial scale. It would be virtually impossible for domestic to compete with the imported castor-beans on a price basis. In addition, it is desirable as a part of our "good neighbor" policy that we continue to purchase from Brazil and other South American countries those products which we do not normally grow in this country.

Castor oil was in great demand in the first World War as an aviation lubricant. During that war an unsuccessful attempt was made to grow castor-beans in this country. It failed because of the lack of adapted seed. Since then satisfactory aviation lubricants have been developed from petroleum. Castor oil has several industrial uses, and a dehydrated product is now being used extensively as a drying oil by the paint, varnish, and allied industries.

Dehydrated castor oil can be used as an acceptable substitute for some of the important purposes for which tung oil is now needed. This is a substitution of great importance because imports of tung oil have been sharply reduced by war in China. Normally the United States imports castor-beans from Brazil and India for processing into oil. The increased demand for castor oil to replace tung oil has resulted

in a sharp increase in imports of castor-beans. In 1940 this country imported, chiefly from Brazil, 238 million pounds of castor-beans. Domestic production of castor-beans is so negligible that official statistics have not been compiled.

## Flax Requirements

Linseed oil, pressed from flaxseed, much of which can be domestically produced, can make up a considerable part of the drying-oil deficiency, but it cannot be used entirely to replace tung oil or dehydrated castor oil because it has different properties. The infant domestic tung-oil industry now being developed in the Southern States is not yet producing enough oil to be an important factor.

The war has reduced our imports of unmanufactured flax fiber, and the critical importance of this material for both military and civilian uses has caused the demand to increase. Farmers in the Willamette Valley of Oregon have this year planted approximately 12,000 acres of fiber flax. Normal production on this acreage will give about 2,000 tons of spinning fiber. This will not equal our ordinary annual imports, which before the outbreak of the war averaged nearly 5,000 tons; but it will go a long way toward supplying essential requirements. Growers of field-cured fiber-flax straw suitable for the production of spinning fiber can get a payment under the AAA program of not more than $5.50 a ton or not to exceed 9,090 tons. If the production and marketing exceed 9,090 tons in 1941, the rate of payment will be reduced proportionately.

This country has grown and processed some fiber flax continuously since colonial days, but the production has dwindled until only 1,000 to 3,000 acres annually have been planted during the last 40 years. It becomes suddenly necessary to depend on increased domestic production, plus what we can get from other sources. There has been a considerable increase in the flax acreage in the British Isles, Canada, Australia, New Zealand, and Kenya; but the British Empire is growing fiber flax primarily for its own use. Our principal source of imports is Peru, where the acreage planted has grown from a small experimental planting in 1939 to more than 20,000 acres this year. Manufacturers in the United States have purchased all the Peruvian fiber available.

More flax-pulling machines will be needed to care for the increased acreage in Oregon, which in 1942 may reach 20,000 acres. Some of the pullers in use are worn out and the number available is insufficient. Properly to handle the crop on 20,000 acres would require at least 125 machines. Some flax pullers are being built at Silverton, Oreg.; others at Plessisville, Quebec. It should be possible to get a sufficient number for the 1942 harvest in Oregon provided the manufacturers have advance notice. It may be necessary to increase the capacity of the retting and scutching plants. Two new retting and scutching plants are being built in Oregon, and the retting capacity of existing plants is being expanded. This expansion will be sufficient, it is believed, to take care of the flax-straw production this year. Meantime, if considerable expansion in acreage is needed, arrangements should be made ahead to reserve necessary seed, so that the available new supply will not be sold for export or to crushers.

## Need for Hemp Increase

In some cases where flax was used before it may now be necessary to use hemp fiber. Maintenance of our nucleus hemp industry is therefore important, particularly to the Navy. In Kentucky and Wisconsin growers of hemp have planted 7,000 acres to this crop—three times the normal acreage. Average production on 7,000 acres, though ample for the normal demand, will not fill the requirement this year. Yet it will tax the capacity of existing harvesting and processing machinery. Necessary further expansion of hemp growing will set problems for machinery manufacturers.

The United States has imported a little hemp fiber from Italy in recent years; it has not been able to get any from other important hemp-producing countries, such as Russia, Rumania, and Yugoslavia. There is a small hemp industry in Chile. Some shipments of Chilean hemp are now being made to the United States. In 1942 the United States will need considerably more than a million pounds of hemp fiber, and the increase will have to come chiefly from expansion in our own hemp acreage.

There may be an acute shortage of machinery for handling hemp fiber. Farm-machinery companies in this country built hemp harvesters and hemp gatherer-binders during World War I but stopped afterward. Machines produced then have been used to harvest all the hemp grown subsequently. Some of them were sold recently for export to China.

Attempts made this year to arrange for the manufacture of a small number of these machines came to nothing. One of the companies that made such machines during the last war could not undertake the job. It offered to supply drawings and all patterns and parts in its possession to any other concern that offered to do the work. Negotiations with this in view failed, however, because the estimated cost for the small number of machines then desired ran too high. Another attempt is being made now to arrange for the building of the necessary machines.

## The Farmer's Stake in Defense

It's a poor rule that won't work both ways. In the last ten years or so farmers have developed a program based on the idea, which Congress and the people have accepted, that what is truly good for agriculture is good also for the Nation. Now we must also apply the rule the other way. What is good for the Nation is good also for its agriculture, and therefore cannot conflict at all at bottom with policies undertaken for agricultural reasons. There may sometimes be an apparent conflict but not a real one. Farmers owe it to the country to take a national view of what affects them, since nonfarmers have already recognized a national stake in agriculture's welfare.

There is no question, of course, as to the principle involved. What the nation requires, particularly in the present emergency, is necessarily also what agriculture requires, because agriculture is the basic half of our economy. In all vital matters its interest is one with that of the entire community. It can fairly raise questions as to ways and means, and even as to particular objectives. But nothing that is really

for the country's welfare can be against the welfare of the farmers. Not the rule but the application of it is the source of confusion, especially in matters that farmers usually do not study. One trouble is the normal lag between events and ideas, which results partly from the time required for new facts to become known widely and partly from the time required to sift and judge them.

What happened when agriculture was advancing its program provides an illustration. It took time for the nonfarm community to realize that laissez fairé was out of date for agriculture, and more time for it to learn that cooperative crop adjustment, commodity loans, surplus disposal, and conservation payments were good for everybody as well as for the farmer. It wasn't overnight that city people dropped their old ideas about agriculture and got a new set in harmony with the new facts. Perhaps we face now a corresponding lag in agricultural thinking, which may be dangerous if it lasts too long. Farmers may not yet be aware of the extent to which the world emergency changes farm objectives, and still less of the extent to which it gives national aims priority.

Recently, for example, the Department surveyed Midwest farm opinion as disclosed in interviews held with farmers by State Defense Board committeemen. Many farmers did not distinguish between the regular AAA sign-up and the food-for-defense program. They had small knowledge of the current demand situation, of the Government's price-supporting policy, of the need for better feeding rather than herd expansion in the dairy program, of the production goals in general, and of the vital national reasons for current agricultural policy. Significantly, a later survey showed a jump in the number of farmers acquainted with the scope and nature of the food-for-freedom drive. On one feature of the Nation's wartime program, the effort to improve our relations with Latin America, there was continued misunderstanding.

Even agricultural officials, with abundant data at their hands, have not found it easy to shift their thinking over from peacetime to wartime requirements. They have been saturated for years with thoughts about the agricultural surplus problem. The sudden need for more production, not in all lines to be sure but in many, has found them somewhat unprepared. It is therefore not surprising that farmers, with scantier information, should still in many cases be in a pre-war stage of thought, and should continue to see their job in purely agricultural terms rather than in terms also of the national emergency. But time presses. Farming is a defense industry, with heavy defense responsibilities; it should mesh with the rest of the country's defense equipment. This is difficult if farmers do not look beyond their fences.

## Broad National Interests Involved

It is especially important for farmers to take a national view of our relations with Latin American countries. Trade agreements rub sore spots in agriculture's skin. Viewed in a purely commercial sense, they stir old prejudices; for agriculture in South America is largely competitive with agriculture here. Existing agreements do not harm our agriculture in any way; in fact they benefit it, because they open doors in Latin America for United States products both agricultural

and industrial, and consequently improve our domestic market for agricultural commodities. Yet they excite fears. Farmers should remember that the agreements have more than an economic justification. They are pillars in our hemisphere defense—vital safeguards against Nazi penetration both commercial and military.

Conceivably, for lack of ties with Latin America, we might lack hemisphere defense. What would be the fate of agriculture then? It would have no European market, or none that would be worth while; for Germany would be master there and free to supply itself from Argentina, Paraguay, Uruguay, Brazil, and other South American countries. That would be a heavy penalty for the refusal of mutual trade with Latin America. If we did business at all with triumphant Germany or its conquered countries, what we sent out would be munitions for an attack upon us. To take a narrow view of our relationship with Latin America is perilous shortsightedness.

Other aspects of our national policy demand broad thinking on the part of agriculture. Needless to say, the price policy is one. Only up to a certain point can prices rise without hampering defense. Beyond that point, which comes when production in fields and factories is at or near the maximum, further price gains mean competition between the government and the people. This drains both public and private buying power. There is no advantage then for any group in price advances. There is heavy disadvantage to the Nation and consequently to farmers and the other constituent groups.

Broad national views are essential with regard to the food-for-freedom drive. There are some risks in it, as no one can honestly deny. Farmers have bitter memories of what happened after World War I, as an aftermath of crop expansion then. They don't want the same thing to happen again and realize no one can safely promise it will not. Here the decision as to what they should do depends on many things, among which the defense requirement is the most imperative. The decision depends also on knowledge of the Government's plans for supporting prices when the emergency is over and for aiding a shift in industry from defense to nondefense production. There are also the safeguards of the Nation-wide crop adjustment system, with its storage and marketing quota features, and of the food stamp plan and other surplus disposal machinery. Nevertheless the risk to some extent remains. Farmers should not forget the vastly greater risk of letting Hitler win. That would be an infinitely worse calamity. It would mean good-bye to benefit payments and would write tribute in the record instead—farm tribute to a foreign government.

## Farm Improvement in 1941

The position of the farmers improved greatly in 1941; later sections of this report will give details. Here it suffices to note that the farm price average rose nearly to the 1909–14 parity and that the income from farm marketings seemed likely to be close to 10 billion dollars, as compared with 8,354 million dollars in 1940. Crop and livestock reports indicated record sales. Government payments to farmers were somewhat below the 1940 total of 766 million dollars. Farm wages advanced and also the costs of many of the things that farmers buy; but the farm price average rose more than the nonfarm price average.

There were good prospects that the improvement would continue into 1942, on the basis of a rate of industrial activity by far the highest in our history and with more people working at nonagricultural occupations than ever before. It seemed likely, however, that the charges for marketing foods, which make the spread between farm and city prices, would advance, in a change from the downtrend of recent years. Producers of cotton, wool, and tobacco felt an unfavorable change in marketing costs in 1941. They received a much smaller share of consumer spendings for their products than did food producers. In the 6 months ended June 30, 1941, the blended price of 17 unfinished-cloth constructions rose by 46 percent, and less than half of this increase was passed back to lint cotton. Broadly, nevertheless, 1941 was the best year agriculture in this country has had since 1929.

It is well to bear in mind the wholly abnormal character of the improvement. The war has stripped agriculture of much of its usual foreign market and substituted only lend-lease shipments. These are not trade at all in the ordinary sense. Up to the middle of 1941 we exported less than during the second year of the first World War and scarcely more than a third of what we exported annually during the 1930's. We have not discovered how to do without a substantial foreign trade in farm products though we depend less on it than we did formerly, and lack of such trade is one cause of the need for large Government payments to farmers. With its lend-lease food exports, our program of aid to countries that are resisting aggression has objectives that go beyond the economic sphere; but it does not ignore economic objectives. One of them is the restoration of normal international trade, with hope of a permanent outlet for the products of our export acres. It is vital to farmers that the program succeed. The shrinkage caused in our farm export trade by the disturbed conditions of recent years, and finally by the war, wipes out the market for the products of about 40 million acres, chiefly in cotton, wheat, and corn. Victory of the Axis powers would mean loss of this trade indefinitely, or the recovery of some of it only on Axis terms. Meantime we have virtually no foreign sources of farm income.

## Scope of Domestic Consumption

How far can the domestic market compensate for a possibly continued lack of export outlets? In terms specifically of the export commodities this is to ask whether the domestic market can double its consumption of cotton, increase by one-third its consumption of wheat, increase by 10 percent its consumption of livestock products derived from corn, and increase its consumption of tobacco by 75 percent. The answer, for the near future at any rate, is no. The domestic market is not elastic enough. Not even the current rise in the national income, with the prospect of a further rise, promises entirely to offset the loss of the export market.

In cotton the per capita consumption trend which was upward until 1914, has given way to a downward trend. For 20 or 30 years it has averaged about 27.5 pounds. That level of consumption, which is relatively high, means an annual domestic use of only 8 or 9 million bales, or about half our cotton-producing capacity. In wheat likewise the trend is downward. In 1939 it was 222 pounds per capita, as com-

pared with 250 pounds in 1929 and 298 pounds in 1909. In fact cereal consumption per capita declines as national income rises; consumers increase their consumption of other items such as meats, dairy and poultry products, and fruits and vegetables. Consumption of corn in the form of livestock products and consumption of tobacco may increase but not sufficiently to absorb all the capacity formerly devoted to the export production.

In food consumption for the country as a whole there is slight flexibility. In most years the United States consumes between 1,830 and 1,900 pounds per capita. Alternations of prosperity and depression affect the total very little. It takes just about 2 acres of harvested land per capita to supply our domestic needs. If we diverted 20 million acres from cotton to food production, it would take the population growth of the next 12 years to absorb the increase at the present rate of consumption. Men in the Army tend to consume about twice the national per capita quantities of some foods; but at this rate 2 million men in Army service would add only about 1.5 percent to the total annual domestic consumption of food. Four million men in Army service would add only 3 percent. There are important possibilities of increased food consumption among the low-income groups, where underconsumption exists both from lack of income and from lack of food knowledge. Even full development of these possibilities, however, would not greatly increase the rate of food consumption per capita for the Nation as a whole.

## Farm and Nonfarm Population Balance

The distribution of the population between town and country is a vital agricultural problem. In the 1930's the population on farms declined only from 24 to 23 percent of the national population. In the previous decade the decline was about 5 percent; it was about the same in the decade 1910 to 1920. The change was the result largely of the depression, which discouraged migration from the farms to the towns and left too many people on the land.

It should not be assumed that if there has been no depression the decline would have continued at a rate of about 5 percent for the decade. In the 1930's we had practically no net immigration from foreign countries. There was considerable net immigration from foreign countries in the two preceding decades. Moreover, the influx then added mainly to the urban population. With immigration virtually absent and with a relative increase in the urban population possible only through migration from the farms, such migration would have had to be extremely heavy to continue the 1920–30 rate of urbanization.

Actually the net migration from farms during the 1930's amounted only to about 3½ million persons. It would have been something like 6 million persons had the rate been the same as that of the 1920's. The fall in the rate of urbanization involved a corresponding increase of possibly 2½ million farm persons of working age and of about 5 million farm persons of all ages. Had these persons not remained on farms, the annual income from farm production would have meant a somewhat higher farm standard of living than that which actually prevailed.

In all probability the total farm earnings would have been larger, because the agricultural market would have been larger. Moreover, the larger total would have meant larger shares for fewer persons. This, of course, is a broad general proposition; it does not necessarily mean that the increased rural benefit would have been equally distributed. Much of the drop in the migration rate was in areas of very low farm income which produce very little of the total farm output. The transfer of people from these areas to the cities does not in itself greatly change the volume or the distribution of the farm income, although it may increase the urban market and lessen the cost of rural relief.

### Migration in Defense Period

The National Defense Program draws farm people into military service and into industrial work and in that way tends to restore the former balance between the farm and the nonfarm population. How many people the defense program has drawn from the farms already we do not know. Adequate data are not available. Certainly it has drawn a good many. Everyone recognizes, however, that the tendency may stop when the war stops. It is important, if the cityward movement of farm population becomes large during the defense emergency, to guard against an excessive return flow afterwards. Various bad effects will attend a sudden return of population to the land, among them an increase of rural unemployment, new movements into submarginal farming, and a general stimulus to overproduction. Some combination of rural-urban work opportunities may be necessary if the ebb tide is strong.

### Our Changing Industrial Map

Regional shifts in industrialization involve agriculture. In the growth of our national industrial plant first one area and then another took the lead. In general, the growth of industry has tended to move westward and southward during the last 80 years. In the 50 years which ended about 1880 the growth of manufacturing in the Midwest exceeded for the first time the rate of growth in the Eastern States. During the next 20 years, the last two decades of the nineteenth century, Southern States nearly equaled Midwestern States in the rate of industrial growth. This trend continued throughout the first decades of the twentieth century.

On the other hand, during this latter period, several Western and Midwestern States—Minnesota, Kansas, Nebraska, and Colorado—did not keep pace. In the period between 1930 and 1937, the States that led in industrial expansion were Michigan, South Carolina, Maryland, and Arizona. These changes produced corresponding changes in the agriculture map—notably increased production near cities of dairy products and truck crops.

The effect on agriculture of regional shifts in industrialization has been particularly great under the defense program. About 69 percent of the defense contracts have been assigned to the northeastern section of the country, which had about 76 percent of the country's manufactures. This is the region north of Tennessee and North Carolina and east of the Mississippi. In California and Washington,

which previously had only 6 percent of the value added by manufacturing in the country, about 16 percent of the defense contracts have been awarded. On the other hand, the Southern States, which in 1939 produced about 10.2 percent of the value added by manufacturing, have only about 8.5 percent of all war contracts.

In general, most of the Southern and Midwestern States have a smaller proportion of defense contracts than they had of the total amount of manufacturing carried on in the country in 1939. A few States, notably Connecticut, Massachusetts, Maryland, and New Jersey in the East, Virginia in the South, and California and Washington in the West, have a much greater proportion of defense contracts than they originally had of industry as a whole. If these trends continue, the Midwest and South will not hold their own industrially during the emergency, while States on the Atlantic and Pacific seaboards will have their industrial trends accelerated.

The implication for agriculture of these industrial trends under the defense program is important. It is unfortunate from the standpoint of surplus acres and surplus crops that the cotton States should have less than their proportionate share of the defense industrial expansion. More than a million persons of working age who are associated with cotton production should be absorbed into nonfarm industries. Growth of defense industries in the South would help. The rapid rise of industry in the Far West will emphasize agricultural production there for local markets. Here and elsewhere the defense industrial program will affect rural and urban land requirements, the balance between farms and forests, and the composition of the agricultural output.

### Coordinating Farm With Industrial Trends

Research in Government and private agencies should strive to foresee the consequences of these changes, so that action agencies can take account of them in agricultural and other planning. They specially affect land use concepts and policies, policies with regard to land tenure, the direction of land settlement, land taxation, and conservation. How the National Defense Program takes root industrially will affect all manner of rural interests, not merely during but after the defense emergency. It will especially affect measures for aiding displaced and underprivileged rural people, and for promoting rural rehabilitation. There will be special need when the program tapers off to guard against a sudden increase of rural unemployment and a sudden disruption of agricultural markets in defense-industry localities.

Various agencies of the Government are studying what can be done. Among other proposals this Department has advanced the idea of a rural works program that would marshal available rural manpower for conservation on farms, ranches, and forests. Such a program would serve the double purpose of aiding needy people and conserving natural resources. Also the Department is cooperating with the National Resources Planning Board and with the Bureau of the Budget in accumulating a "shelf of projects," which can be drawn on as occasion requires either during or after the defense emergency. As described later, this Department is cooperating in many ways with other public agencies in post-defense planning.

Most of the projects will have important land use and conservation features. In technical phases of this work the National Resources Planning Board has the main responsibility, while the financial phases concern the Bureau of the Budget. There is a corresponding division of responsibility within this Department. The Office of Land Use Coordination considers technical aspects of the problems involved; the Office of Budget and Finance examines the fiscal aspects. Projects born in other agencies of the Government come here for evaluation, criticism, and suggestions; projects initiated here make the rounds of the other agencies. Programs for transcontinental highways, for rural housing, for water conservation, and for power development may enter into the employment situation. They will deeply concern agriculture, and later sections of this report will discuss some of the problems involved.

## PRICE CONDITIONS AND FARM-PRICE POLICY

In 1933 the first Agricultural Adjustment Act set up a goal called parity for agriculture. Broadly, it aimed at bringing farm prices into the same relationship with other prices that they had held during the period 1909–14. This was the base period taken for all agricultural commodities except tobacco. The base period taken for tobacco was the period August 1919–July 1929. As is well known, the measure authorized various means of working toward parity. Subsequent laws provided additional means. This year many farm commodities are at or above the parity level. The income from agriculture as a whole may equal or exceed parity as it did in 1937, but the prices of several commodities and the income of several farming areas will still be below parity.

As a result of the greatly increased defense employment and workers' income in the United States and of shipments to Great Britain under the lend-lease program, farm prices have advanced sharply. Several products, among them cottonseed, wool, all dairy products, chickens, and meat animals, are above parity. Cotton is near parity. (Only cattle, lambs, and wool were above parity in September 1940). There has been a notable advance in hogs. The average farm price of hogs in September 1941 was $11.10 a hundredweight, as compared with only $6.14 in September 1940. Beef cattle and lambs in September were 20 and 30 percent higher, respectively, than a year ago. The farm price of butterfat was 37 percent higher; it rose during the 12 months from 27.1 cents to 37.2 cents a pound. The advance of some commodities above parity is the result primarily of the increased domestic demand for them.

The high loan rate on wheat, along with continued storage of wheat in the Ever-Normal Granary, has lifted the farm price of wheat. It was 96 cents a bushel in September as compared with 63 cents in September 1940. Cotton prices have risen likewise through the influence of the Government's program. The price index for cotton and cottonseed in September was 150 percent of the 1909–41 level. The index for truck crops was 145; for meat animals 166; for dairy products 140; and for chickens and eggs 141. The index of fruit prices was 89 percent of the 1909–14 level, compared with 73 percent a year earlier. Feed prices have advanced considerably.

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Farm prices do not precisely measure farm incomes. For example, our cotton crop this year is smaller than usual. Larger production, along with parity returns, would mean larger cotton incomes. Farmers have voted marketing quotas on themselves for cotton, wheat, and tobacco. What they produce above their allotments they must withhold from the market or market subject to a penalty. In other words, the higher prices apply on these crops only to a limited volume of production. Yet the parity-income goal is nearer this year for most farm commodities than it has been for more than a decade. For many farm products farmers are receiving parity prices for a maintained or increased output. Farmers are receiving near to a parity income in 1941 and will apparently receive a full parity income in 1942.

Other goals of the farm program are still distant. Most of the South's farmers, for example, are neither secure nor prosperous. There is distress also in parts of the Great Plains. Most areas have some grave land use maladjustments. Agricultural inequality, rural poverty, widespread soil erosion, the growth of tenancy, and other agricultural evils, remind us that price parity is not enough to cure all farm problems. In one sense, however, all our farm goals are nearer because we are closer to parity. Adequate farm earnings are the key to many other farm benefits.

## Farm Expenses

In a period of rising business and higher prices, however, farm costs as well as farm prices have a tendency to rise. In September the ratio of prices received to prices paid by farmers was 105. This ratio is a measure of the unit purchasing power or exchange value of farm commodities. Expenses of farm production will average higher this year than they did in 1940. Farm wages in July, for example, were 160 percent of the pre-war average, as compared with 129 percent in July 1940. Taxes and interest charges were about the same.

So far, however, the prices paid by farmers have risen less than farm prices. The 1941 increase in expenditures will be less than the increase in the gross farm income, which with Government payments included may come close to parity for the year. The total income of American farmers will be the largest in 11 years. But higher incomes in dollars may lose their meaning if costs rise proportionately. Farmers need to question whether they are heading into an inflationary period where further rises in prices would be of little value, because of equally great inflationary rises in the prices of things farmers buy.

Farmers have been chiefly occupied since World War I with surplus problems and with related disparities between farm and nonfarm prices. They face a somewhat different situation now. The position of the great export crops is still unsatisfactory; but with many other products the problem is becoming one of production rather than of prices. Our own demands are increasing; British needs and lend-lease funds are causing a large movement of food to England. Only in cotton and wheat are supplies still heavy in relation to the demand. In most other lines the immediate job is to expand the output as rapidly as the slow turn of the seasons and of feeding and breeding periods makes possible. This tends greatly to change the farm price

outlook, and to set new and different problems for the farmers. Care and foresight are as necessary with these problems as with the problems of depression periods.

There is danger in dwelling too much on high prices and forgetting that such prices do not always mean correspondingly high incomes. One recalls Aesop's fables about the dog that dropped his bone to snatch at its reflection and about the slaying of the goose that laid the golden eggs. Excessively high loan policies, the freezing of wheat and cotton stocks, and other measures that put barriers between production and consumption, do not ensure gain for agriculture in the long run. Temporarily such policies may be necessary. But we should keep them flexible; otherwise they may produce only an illusory benefit. Efforts to push farm prices above parity may endanger the parity principle itself. The national farm program, with its commodity loans and its parity and conservation payments, has had the full support up to now of the general public and of consumers. This is because it has been fair. Attempts to make it unfair, to raise farm prices out of line with other prices, and to bolster them with artificial scarcity, might prove disastrous. We should think carefully and long before going beyond parity in our price goals. Now that we have got parity, let us keep parity, and the way to do it is not to ask more.

There is a perfectly practical and obvious reason for stipulating that no ceiling should be imposed on farm products at exactly parity. As every farmer knows, farm-product prices fluctuate every day. The supply of a commodity coming on the market changes from day to day, and the demand changes from day to day. Prices fluctuate accordingly. Price fluctuations may be desirable to stop the flooding of markets at certain periods. As a rule daily price fluctuations are relatively small, but they ought to be allowed for in order to keep to a minimum the amount of admiinstrative supervision necessary.

If ceilings were placed exactly at parity, the daily fluctuations in the market would necessarily all be between parity and some lower figure, and as a result, farmers could not possibly average parity. The real purpose of restricting ceilings to a point somewhat above parity is to make it reasonably sure that all farmers will have an opportunity to get parity. After all, it happens to be the expressed policy of Congress and the administration to achieve and maintain farm prices at parity.

## Price Problems of Export Crops

The raising of the loan on cotton to 85 percent of parity helps to keep cotton prices in line with the general increase in the prices of all commodities. In the last year the domestic demand for cotton has increased greatly; in fact, sufficiently to consume a record quantity. Consumption in the United States at an equal rate in 1942, along with small exports, will absorb our 1941 cotton production in the 1941–42 marketing season, and may result in some reduction in the large stocks on hand. When the war stops we may be able for a time to export more cotton. Two facts, however, should be kept in mind. In the first place, we have no assurance that the abnormal

domestic demand created by our defense effort will continue. Second, stocks of cotton are accumulating in foreign producing countries as well as in the United States. Moreover, foreign cotton production is being maintained at a relatively high level. Hence, we must manage our cotton program in such a way as to facilitate the marketing of the accumulated surplus as soon as the opportunity to do so offers.

Ultimately, we may have more trouble with our wheat surplus than with our cotton surplus. There has been no increase in the domestic demand for wheat as a result of the defense effort. Canada can supply all Great Britain's requirements and the requirements also of any part of continental Europe that may be open to overseas wheat after the war. It can do so at prices far below the level at which we are now holding wheat. Maintenance of the price of wheat at its present level in the United States tends to reduce the feeding of wheat to livestock. With corn prices at their present level and with wheat prices held up to 85 percent of parity, it is not likely that much wheat will be fed. Furthermore, deferred deficits will not accumulate for wheat in Europe as they may for cotton. Many European countries are producing most of the wheat they need. Surplus-producing countries elsewhere stand ready to make up at once any deficits that may exist. In the United States, if we do not have a very short crop in the near future, we may have to devise some plan for encouraging a largely increased use of wheat as feed for livestock.

We cannot avoid indefinitely the alternative of adjusting the production of such crops as cotton and wheat to the actual requirements. We may continue for a long time to hold cotton and wheat off the market and in that way to maintain our prices in the domestic market. Such a policy, however, will tend to cause a decline in the consumption here as well as continued difficulty in the export field. In fact, the export outlets will disappear. Moreover, there is certain to be a public reaction against carrying these commodities indefinitely. Taxpayers may not object strenuously to carrying wheat and cotton through an emergency and as long as there is some prospect of absorbing the accumulated surpluses in the course of time. They certainly will object, and they will have a right to object, to an accumulation of stocks indefinitely, far in excess of amounts needed for the Ever-Normal Granary as protection against bad years. Our accumulated stocks must be disposed of as soon as possible after the restoration of peace, perhaps before normal world trade conditions for these commodities have been restored.

## Price Trends in Two World Wars

In both world wars, after an initial spurt, the combined wholesale price average sagged off for about a year and then started up again. This time the second upswing for a while was less sharp than in the previous war period. Since April 1941, however, it has been just as sharp. But the advance has been less in the nonagricultural than in the agricultural sector. As a matter of fact, prices of nonagricultural products have advanced much less sharply than they did in the previous war, and much less sharply than the general price average. Prices of farm products, on the other hand, have advanced more

rapidly than they did in World War I, particularly this year. Since April 1 last the advance has been greater than the entire previous advance. It should be remembered, of course, that the starting point was relatively lower. Farm prices in 1939 averaged 7 percent below the 1910–14 average. Even yet, farm prices have not caught up with nonfarm prices. At the end of August the wholesale prices of farm products were 87 percent of the 1926 average; whereas nonagricultural products in the same month were at 91 percent of the 1926 level.

Prices of food so far during the present war have behaved much as they did during World War I. The chief difference has been a more rapid advance lately. The cost of living as a whole has advanced not quite as much in the present war to date as it did in the comparable period of the last war. Food is one of the cheapest components of the cost of living; it has not yet caught up with some other items in the family budget. Food prices in August stood at 82.2 percent of the 1924–29 average, as compared with 85.5 percent for all living costs combined. There was an advance between March and August of 10 percent in the cost of food and of 5 percent in the combined cost of living. Continued advances, however, would make a difficult problem for consumers, especially for those on fixed incomes.

## The Supply Factor in Price Control

Both industry and agriculture are trying to match the price advance with increased production. Success in the undertaking will promote price stability. Prices of manufactured products have been much more stable so far than they were in World War I. Even in hides, leather, and textile products, where advances have been marked, the gains have not been as rapid as those of 25 years ago. These products enter fairly competitive markets. Products of the metal and chemical industries, and of other large industries that operate under controlled conditions, have been relatively stable, in comparison with the tremendous advances that took place in these lines in World War I. Many businessmen are helping in the efforts for price stability through increased production.

In iron, steel, tools, machinery, and guns—the key products for defense—our factories have almost doubled their output. This was possible because these industries had been operating far below capacity. Even so, the output of basic metals has proved insufficient to meet defense needs, and new plants are under construction to overcome shortages in steel, aluminum, and other basic raw materials. Meanwhile, production of automobiles, refrigerators, house furnishings, and other metal articles for consumers is being restricted in order to release metals for defense.

Production of nondurable industrial goods has also greatly increased. Output in this category is almost a third higher than that of the period immediately before the outbreak of the war. Expansion in textile production has been phenomenal, much of it for defense use. The output of many other processed farm commodities, especially that of the meat, canning, and preserving industries, has risen about one-fifth above the 1939 level. Expansion has been least in consumer goods and manufactured foods; but in these lines output was already high before defense expansion began.

## Industry's Cooperation With Government

Two conditions have aided industry in greatly expanding production with only moderate increases in prices. (1) Industry entered the war period with considerable idle capacity; whereas factory production was near capacity in the first period of World War I. This enabled industry to satisfy the first impact of the defense demands by expanding operations in the existing plant. Now that practical capacity has been reached, expansions in capacity, for raw materials and for rail transportation, are becoming imperative. (2) Industrial leaders have cooperated with the Government in price controls.

This cooperation has led, for example, to a price-freezing order on iron and steel; to price-freezing orders on aluminum and steel scrap; to informal agreements on copper and other nonferrous metals; to informal arrangements with farm-machinery manufacturers as to price policies; to efforts to prevent advances in automobile prices; and to various priority restrictions, which limit the civilian demand. These controls have moderated though they have not wholly prevented industrial price gains. They have also helped insure that farmers will continue to be supplied with vital materials, such as machinery and repairs, containers, and fertilizer.

Farmers understand the need for parallel expansion in agriculture. It covers practically all farm commodities, except wheat and cotton, burley tobacco, and to a lesser extent corn, in which lines we have large stocks. In meat, dairy and poultry, and fruits and vegetables, the call is urgent. Farmers could get more income by holding their production where it is and letting expanding demands drive their prices higher. But this would be noncooperation in defense. Moreover, it would threaten them with loss of consumer support for their national farm programs. In addition, it would have dangerous inflationary implications.

## Dangers to Agriculture in Inflation

After the inflation of World War I, farm prices plunged downward. Farm costs and taxes remained high. Freight rates and farm-machinery costs were about two-thirds higher than pre-war; city wage rates were two and one-half times higher; taxes two and one-half times higher. Taxes and wage rates continued to rise through the 1920's, and did not decline until after the depression of 1929. In most years, from 1920 to 1940, farm prices were far below these cost factors. In 1925 the farm debt per acre was nearly three times the pre-war debt; interest and taxes were two and one-half times higher. Farm returns and land values on the other hand were on the downgrade. Hundreds of thousands of farmers lost their farms through foreclosure. Thousands of country banks failed.

For agriculture the special danger of inflation is the illusion of advantage it gives at the start. In the first stage of the uptrends the prices of the things that farmers buy go up less rapidly than farm prices. In this period farmers seem to benefit. Once these things get up, however, they stay up both longer and higher than farm prices. Hence, the farmers' gain is swift but short. The gain that other groups get, though not so swift, is far more lasting. It is

clearly shown in the tendency for the farmer's share of the consumer's dollar to decline. The best protection is not to let the inflationary process begin, and the next best to hold it within limits if it gets a start.

Farmers have received a smaller share of the consumer's dollar since World War I than they received before then. The post-war farm proportion has been from 45 to 50 cents, as compared with the pre-war proportion of 55 cents. At the depression low point of the 1930's the farmer's share of the consumer's dollar dropped to about 35 cents. Marketing costs are like farm debts and farm taxes, in that they do not decline with prices. Agricultural prices are much more flexible than agricultural costs, and depressions or deflationary periods invariably widen the spread between farm and retail prices. Only by avoiding the fever of price inflation are we likely to avoid the chills of the deflation which inevitably follows.

This does not mean that farmers would profit by keeping their own prices down while other prices went up. If they did that, the general downswing later might find them without cash reserves. They would be in trouble themselves and no one would benefit. No single group, not even one as large as the farm group, can chart a price course different from the general course. Whether they like it or not the farmers have to keep in line with the general price level. But with Government help and the cooperation of nonfarm groups they can help to prevent the general price level from rising to precarious and dangerous heights.

### Growth of Purchasing Power Faster Than Goods

Among the causes of inflation is the growth of purchasing power for goods faster than the production of goods can be expanded. The Government's defense expenditures cause it to put more purchasing power at work. To the extent that this money comes out of taxation or out of borrowing from consumers, it does not increase the total in use. To the extent that it comes out of borrowing from the banks or from note issues, it does add to the total monetary circulation.

One means of checking or preventing inflation therefore is to tax current incomes heavily. The precise method is important. If the previous production or flow of consumer goods were continued, while increases in pay rolls and profits were drawn currently into the Treasury to be used in purchasing goods for defense, and if defense production could meanwhile be increased as rapidly as Government expenditures for defense, inflation certainly could be prevented. Defense and war efforts, however, are as a rule not wholly financed in this manner.

The Government places huge orders that absorb more than the surplus capacity of factories, and production of some things for consumers has to be restricted. The order for increased production results in increased pay rolls. This provides for an increase in consumer incomes without an increase (and possibly a decrease) in goods available for consumers to purchase with their increased incomes. Next comes bidding up of the prices of the available goods.

In the meantime, the manufacturers bid up raw materials in order to obtain supplies necessary to produce the extraordinary requirements of the Government, as well as to supply consumer require-

ments. The increase in the demand for labor results in higher wages, which in turn result in increased costs of production and distribution. Then inflation is on the way.

Another way to prevent inflation would be by rationing all purchasers and fixing all prices. Consumers could purchase only as much as would be available for them after defense needs were satisfied. This system is in use in many of the warring countries today. Though we have started to use priorities and price controls we are yet far from any such complete control of all buying and selling.

Governments in wartime cannot wholly avoid inflation because usually they do not tax sufficiently and cannot expand production enough to take care both of defense needs and of consumers' demands. Consequently, they have to expand their credit. They have to get funds from the banks. Payments increase faster than goods. There is a rising spiral of prices, living costs, wages, and prices. This general inflation makes the benefit of rising prices and wages illusory. All groups in the community have a common interest in helping the Government expand production and keep down its borrowing from the banks, and in assenting to reasonable price controls. What the citizens let the Government take from them directly, through taxes or genuine public loans, costs them far less in the end than the headaches which accompany and follow inflationary procedures.

## Basis of Government Price Policy

The price policy of the Government as outlined in various statements by the Office of Price Administration [1] is to prevent rapid and unmanageable price rises during the defense emergency and to stave off inflation. The policy includes three related functions: (1) To protect consumers; (2) to work for increases in civilian supplies; and (3) to make programs for allocating supplies to civilian needs when shortages occur. Governmental price policies that affect farm products are developed by agricultural officials in cooperation with the Office of Price Administration. To a considerable extent the program utilizes existing agencies of this Department.

The Administration has indicated several different ways of dealing with commodity shortages and any threats of excessive price increases that they may involve. One means is the expansion of production. This is the means on which the Government places the most reliance for the time being. The best guarantee against excessive price advances is adequate production, and the Government adopts every means it finds available to increase the output both of defense and of essential nondefense items. This policy combines the objectives of defense production, the maintenance of living standards, and control of the price situation.

As a supporting measure, the Government relies, in the second place, on direct price controls and priorities. In both these fields programs are gradually being developed. Priority systems have been applied already to a considerable number of raw materials and alloy steels. Considerable expansion of the priority system is inevitable.

[1] Until August 29 this agency was known as the Office of Price Administration and Civilian Supply (OPACS).

Along with the priority method, which earmarks the available supplies of certain materials for certain preferred purposes, the Office of Price Administration is developing various direct and indirect controls of prices and speculation. They range from simple requests to manufacturers not to increase their prices to definite devices for the prevention of speculation or undue price advances. Such methods have been applied, for example, to pepper and rubber. Schedules have been announced that fix a ceiling on prices of scrap aluminum, second-hand machine tools, cotton, silk and rayon textiles, steel, sugar, and many other commodities.

## Monetary Measures Available

Also, the Government has monetary measures at its command for controlling the volume of currency and credit. The Federal Reserve Board has recommended a general plan of action in this field and has put into effect various restrictions on the use of consumers' credit. Various schemes of taxation are in the making for controlling purchasing power, preventing inflation, and stabilizing the price level. Some of them aim chiefly to raise funds; others seek primarily to control the price level.

Several have both objects in view. Most tax authorities agree that income taxes within the moderate income bracket should be increased above predefense levels and that a general sales tax should be avoided. Suggestions have been made, however, for a heavy sales tax on semidurable goods and for manufacturers' taxes on special products such as automobiles and refrigerators, when short supplies might otherwise encourage large price increases and give the manufacturers large increased profits.

The sale of Defense Savings Bonds to individuals on a voluntary basis as at present, or the use of plans for forced savings which would require all persons to invest a portion of their income in Government securities for the duration of the defense period, are other monetary methods of financing defense without tending toward inflation.

## The Field of Agricultural Prices

In the field of agricultural prices this Department has held that advances ought to be permitted until disparities between farm and nonfarm prices have been corrected. In April the Office of Price Administration endorsed this principle and joined with the Department in steps to increase the prices of certain products, so as to stimulate increased production. It concurred, for example, in a plan to give farmers long-term support of the prices of pork products, dairy products, and poultry products, and announced also that it would support administration policies directed toward the improvement of farm income.

"On anything so vital as our food supply," said the price administrator, "we can afford no gamble with an underestimate of our needs." Objections from consumers may be expected, should any agricultural prices rise and remain much above parity. Meantime, however, the increase that has taken place above the recent depression levels has in general been moderate and has served only to correct old dispari-

ties. Supplies of farm products are more important now than prices. In fact, supply is the chief factor in our present defense effort.

Farm prices ordinarily rise in periods of business recovery. This is a necessary reaction from the disparities of the preceding depression periods. Why this happens is a familiar story. Marketing margins stay relatively constant. Almost all the burden of lower retail prices, or almost all the advantage of higher ones, are passed back to farmers. Farm prices therefore vary up or down proportionately far more than do retail prices or consumers' incomes. Further, farm production is very constant, while industrial production is variable. In depressions, farm prices, rather than farm production, decline, whereas the opposite happens in the industrial sphere. The chief industrial response to depression is a big drop in output, which has the effect of preventing a corresponding drop in prices. Recovery tends to correct this opposite movement in the two great branches of the economic system; there is a call for more production in both agriculture and industry, but by reason of its nature the agricultural response is slower than the industrial response. In consequence agriculture has temporarily a price rise materially greater than the rise in the general price level.

## Premonitions of Inflation

Though the average general price level has risen only moderately since the outbreak of the war in Europe, significant individual advances have occurred. They have led to a development of public opinion in favor of a ceiling on all prices. Administratively this would be a prodigious job. Adequate staffs are not available in the public agencies that would have to take part in it, and the necessary legislative authority has not been worked out. Moreover, there is no general agreement as to the level at which prices could or should be fixed. Nevertheless, any rapid and sustained rise in the prices of a large number of important goods and services will surely lead to a serious effort in this field. Farmers and others interested in agriculture should study the facts, possibilities, and proposals.

There is some evidence of hoarding and of undue speculation in food products and essential raw materials. Defense measures have given a stimulus to the prices of some raw materials, and the associated advance in employment and consumer buying power has increased the demand for and consequently the prices of some products. Up to the early months of 1941 the increases were only what might have been expected from the increase in business activity. In the later months some prices began to reflect abnormal influences, such as the curtailment of imports. Another factor in the extraordinary demand for some commodities is the prospect of curtailed manufacturing for civilian uses. The shifting of production from civilian to defense purposes encourages forward buying. With increased employment and higher wages, consumers may eventually be eager to buy even at higher prices. Moreover, denied the chance to spend for some commodities, they may be inclined to buy other things still more heavily. Advancing wages will tend to cause increases in prices. The demand for labor is such that advances given in one industry may have to be paid in others, with resultant increases in the costs of production and distribution.

These are the usual indications of developing price inflation. As yet the tendency is only incipient; but the basis for its rapid development exists. It could be checked and might be stopped by a combination of price controls and fiscal policy. Rapidly to get a large increase in production means that we must pay in wages and prices; but excessive payment ultimately defeats its object, because it absorbs too much purchasing power. In some fields prices can be fixed administratively, through the cooperation of Government agencies with industrialists. It is practically impossible, however, to fix the prices of goods and services generally without complete national control, such as is exercised in Germany. Perhaps the most effective approach to the regulation of prices generally is through a combination of production and price controls and of fiscal policy.

### Moderation Best for Agriculture

Farmers rejoice when farm prices rise. The upward movement is like a good rain after a long drouth. It does not follow that they should charge all that the traffic will bear. Farmers should beware of trying to get everything they can while the getting is good, in the hope that a bad outcome can be avoided. In the final distribution of inflation gains and losses they always lose. What they buy goes up as much as what they sell. When the slump comes, farm prices drop more than farm debts, taxes, and expenses.

Actually, most farmers oppose inflated prices; for themselves they want only fair prices—now and later. As long as the parity principle works they have that benefit. Parity prices of course must rise with other prices; but if other prices rise too fast, as in the end they do in inflationary situations, maintenance of parity is difficult or impossible. Farmers consequently have reason to approve action that will curb speculation and prevent run-away prices, even if it means putting a ceiling on prices, or price fixing in some cases. In its own field, with price equality virtually achieved, agriculture should not push on to a new inequality, under which its own prices would be out of line with other prices. That would be to jeopardize its gains.

## OUR FARM EXPORTS IN WARTIME

It will be convenient now to examine more closely our foreign trade in farm products. In the year ended in June 1941 our agricultural exports amounted in value only to 350 million dollars, the lowest since the United States emerged as an important agricultural-surplus-producing country in the second half of the last century. Not since 1871–72, when the exports amounted to the then substantial figure of 333 million dollars, has so low a level been reached. The year 1941 began with farm exports moving at an annual rate of only 240 million dollars per year. This was the rate for January; it had been the rate for the 4 preceding months. It was less than one third of the average (750 million dollars) for the 5 years that preceded the outbreak of the war. Moreover, this comparison does not truly measure the depth of the farm-export depression. It shows the recent trade against the background of a period that was itself depressed. In each year since 1930 our farm exports have been below those of any preceding year since 1904–05.

In sharp contrast to the depression of the early months of 1941, is the subsequent rise to an annual rate of 740 million dollars—close to the average for the 1930's. The outbound trade first touched that level in June. It is essential to bear in mind, however, that it represents an expansion largely noncommercial in character. Mainly, it is the result of a new factor in our foreign trade; namely, the contribution this country is making to countries whose defense is vital to ours. It can hardly be accounted an export recovery in the usual sense. We cannot use it as a basis for forecasting our post-war exports. Our farm exports in the first half of 1941 were 45 percent higher than in the fall of 1940; normally they would have been lower by about 25 percent. Because of the closing of our markets in Europe, the usual export movement normal to the fall season did not develop in 1940. When the upturn came in the second half of 1941, it was through the influence of the lend-lease program.

In assessing the recent increase in the farm exports, an important fact is that a substantial part of the indicated rise has been due more to an increase in prices than in actual quantities. For example, the value in June was 111 percent above the monthly average for the fiscal year. The quantity index of exports for the same period was only 64 percent higher. Needless to say, the recent figures cannot be taken to forecast a rate that will continue uninterruptedly. It refects large shipments of some products that are not likely to be regularly repeated. This type of movement has occurred in several commodities. Exports of pork products, raisins, wheat, and tobacco, for example, have jumped sporadically in some months, only to drop again to levels more characteristic of the wartime situation. Such movements reflect the prevailing general instability in export trade.

## Changing Composition of Farm Exports

Exports of a number of commodities previously minor in our export trade have increased greatly during the past year. These increases, while overshadowed by the declines in the exports of cotton, tobacco, fresh fruits, and grains, have contributed to the total. In 1940–41 close to 30 percent of our total agricultural exports consisted of such commodities as dairy products, eggs, flour, rice and cornstarch, canned meat, pickled pork and sausages, malt, hops, coconut oil, and drugs and herbs. This same group of exports in the preceding year represented less than 8 percent of our total exports. Because the war has closed many of our normal markets, and, on the other hand, created new types of demand, it has greatly changed the composition of our export trade. But increases in the exports of normally minor export commodities do not compensate us for the loss of major exports.

## Agricultural Imports

On the import side, the year 1941 began with trade somewhat less reduced. The figures were slightly above those for the later months of 1940, though not greatly different from the average of the last few years. Chiefly important to the farmers are the imports of the farm products similar in type to those grown in the United States. In recent years these have fluctuated indecisively at a fairly low level.

In January, for the first time since September 1940, they showed a tendency to rise, mainly from the influence of the growing domestic demand for industrial raw materials. Thereafter, they rose steeply, and by April had reached a level comparable with those of the 1920's. While imports for January were less than 3 percent above the corresponding total for January 1940, imports in June were 40 percent higher than a year previously. Periods of marked economic recovery in the 1930's showed the same tendency to produce an associated rise in our agricultural imports. In some years during the 1930's, however, our own low production of some crops was an important factor.

### Trade With the Orient

Our market for farm products in the Far East, and especially in Japan, has declined from the influence of the war. In 1938 Japan and China together took about 6 million dollars worth per month of our farm exports, mainly cotton. Before they began fighting, they took a monthly average (from 1934 to 1936) of more than 10 million dollars worth. In 1940 the combined total dropped to 2.3 million and China took almost half of that. It is Japan's policy to rely as much as possible on sources of supply under Japanese control or on sources that Japan hopes will eventually come under its control.

In fact, Japan for a number of years has followed trade policies directed toward independence from imports and particularly from imports of United States farm products. Our own high cotton prices have restricted Japanese purchases of American cotton, which in recent years have constituted over 90 percent of our total agricultural exports to Japan. Our control of strategic exports may further curtail our agricultural exports to Japan. Meanwhile increased shipments to China seem to wait upon the course of events in Europe.

### Possibilities in Latin America

It is, of course, not to be expected that an increased trade with Latin America and Canada will provide compensation for the loss of trans-Atlantic and trans-Pacific markets. Countries of the Western Hemisphere are for the most part themselves agricultural. They can use little more of the products of the United States farms than they are taking already. Some of them, like the United States, produce surpluses of wheat, cotton, meat, and other products. True, the market in the New World has shown some tendency to expand; it is expanding for rice, hops, cottonseed oil, lard, tobacco, and grapes. But it cannot provide a sufficient outlet for the unwanted products of cotton, grain, tobacco, pork, and fruit producers. Growers of farm products that cannot be exported at all under present conditions or can be exported only in small quantities can expect little relief, directly or indirectly, from the development of new foreign markets for other farm products.

### The Long-Time Outlook

From the standpoint of prospects for the future an important difference should be noted between our farm export trade on the one hand with Japan and continental Europe and on the other hand with

the United Kingdom. The degrees of decline have been similar. In each case the desire to conserve national resources for a war effort has been a main cause. In Japan and continental Europe, however, trade policies have looked toward permanently increased self-sufficiency and permanently decreased dependence on trade with the United States. In the United Kingdom the wartime trade policy has been clearly labeled as temporary. This difference gives special importance to our trade with the United Kingdom. Relatively, of course, Britain is far and away our most important outlet under present conditions.

Farmers, moreover, benefit substantially from our nonfarm exports to the United Kingdom, which even at the beginning of 1941 had increased by more than 70 million dollars a month. This increase has meant an associated increase in factory pay rolls here and consequently in consumer buying power. As such, it has been a factor in the recent increase in food purchases. In fact the nonfarm export expansion to the United Kingdom may have increased the expenditures for food in the United States by as much as 20 million dollars a month. There has been some increased buying from the same cause of agricultural products other than food. With exports of munitions and other goods to Great Britain increasing further under the Lend-Lease Act, farmers should reap additional benefit. In the long run, the volume is more important than the kind of export trade we have. Farmers can benefit from export trade in factory products as well as in farm commodities.

Yet the precise farm impact of the foreign trade situation is important. Larger total farm exports, and larger domestic consumption of certain farm products, do not directly help the cotton States or the Great Plains. Exporting more evaporated milk, canned beans, canned tomatoes, canned soup, corn syrup, dried peas and beans, and so forth, does not cure the problem of surplus wheat, cotton, tobacco, and hog products. Nor do the growers of the surplus crops get sufficient relief from the growth of domestic buying power. This tends to be spread thin. In varying degrees it covers all branches of farm production. It probably represents a rise of no more than 2 percent in the gross income of any single farm group, and much less than that in the gross income of the surplus-crop producers. Cotton growers are the heaviest sufferers, with tobacco growers next and then growers of certain fruits. Producers of wheat are not getting much relief from the wartime stimulation of our total foreign trade.

In appraising the chances for permanent farm-export improvement we have to compare the situation now with the situation that existed before the war began. In 1938 we exported farm commodities worth 828 million dollars, as compared with the 1940–41 figure of only about 350 million dollars. Still more significant are the export figures for the months since the Lend-Lease Act became effective. The export rate in April, May, and June, even at the higher prices of those months, averaged only about 600 million dollars annually as against 828 million dollars in 1938. Thus, even yet a further increase of some 40 percent would be necessary to reach the pre-war (1938) level. Our export markets in continental Europe, which have almost vanished, totalled 270 million dollars in 1938, an amount even greater than the difference between our total agricultural exports in that year and the current rate.

### Problem of Foreign Purchasing Power

Briefly, the war puts the clamps on the export producers and makes it necessary to continue a curtailment in the output of the surplus crops. It improves the domestic market through the influence of the defense program on consumer buying power. But the benefit to the producer of export crops in the home market is probably not equal to the losses abroad. On the other hand, the war situation is strongly encouraging a shift in acreage away from the export crops. This is due in part to the gain in the domestic market referred to above and in part to the lend-lease program. When the war comes to an end, we will undoubtedly have a much larger proportion of our agricultural plant producing what were formerly nonexport commodities, such as dairy products, poultry, and eggs. But there still will be more acres producing the standard export crops than are needed to supply our domestic market, and the problem of foreign purchasing power for these products will be even more difficult than it was in the 1930's.

## COMMODITY AGREEMENTS AMONG NATIONS

The history of the last century has been one of alternate swings between comparatively free trade and controlled nationalism. Governments have experimented with almost every type of law, tariff, and regulation. The object has been to promote prosperity within their borders and to gain more international trade. Led by governments, the effort in no small measure has been promoted also by private traders. Since World War I, the intensity of the resulting economic competition has increased. It has become virtually economic warfare. Extreme efforts to reach complete self-sufficiency through autarchy or by other policies have developed. If democracy is to maintain its system of government and life, it must have economic cooperation among nations not only as a part of its defense movement but also for reconstruction and progress after the war. Economic peace cannot be maintained without economic collaboration.

Commodity agreements between governments, on plans suggested by representatives of producers, consumers, and traders, are comparatively recent. They are the result largely of the accumulation of large surpluses, of the associated price declines, and of the disorder of cutthroat competition. The first efforts in this direction were primarily emergency measures, arranged either among groups of private traders or by governments. In international trade the intervention of governments to some degree is inevitable. Many governments during the past decade have assumed great economic-control powers. Hence, the part of private traders, producers, and consumers in the negotiation of trade arrangements has declined.

The United States, the United Kingdom, and other countries join in the preparation of such agreements as part of their defense efforts. They do it also to lay a basis for peacetime collaboration. Planning for defense includes looking ahead. No set of relations that helps to win the war can be discarded instantly when peace comes. It is not too early to plan for the reconstruction that must immediately follow the close of hostilities.

## Sugar and Coffee Agreements

Problems of surpluses caused by blockades have led to the negotiation of the Sugar and Coffee Agreements. Longer time considerations have entered into renewed discussions of the International Wheat Agreement. Objectives have been broadened to include matters not heretofore considered. The first chief purpose was the disposal of surpluses; now we find many more things necessary. Among them are means of correcting the surplus problem at its sources, through the stabilization of production internationally. The International Wheat Agreement, prepared by representatives of the United States, the United Kingdom, Argentina, Canada, and Australia, at Washington in July 1941, represents the most recent stage in such negotiations. It goes further toward an international agricultural adjustment program than anything that has preceeded it.

The agreement declares that international cooperation is indispensable to the full development of the resources of the world; that a reserve stock or Ever-Normal Granary should be created to protect consumers; that production must be regulated to demand; that prices should be stabilized at a level in proper relation to other prices and at the same time fair to consumers and producers; that the wheat-producing countries should agree to share the world's markets in periods of surplus; that importing countries should agree to cease the stimulation of uneconomic, high-cost production; and finally, that a stock of relief wheat should be made up by direct contributions by the member governments. For the operation of the purposes of the understanding, an international wheat council is to be set up with full powers to adjust prices, quotas, and shipments to changing conditions.

There is a provision that importing countries shall act as semi-enforcement agencies. Previous international wheat agreements have not contained this feature. No agreement can be beneficial unless it is fully observed by all of the principal producing countries involved. Such schemes have usually failed in the past because they have lacked flexibility and could not meet unforeseen circumstances. Participation of importing countries in the enforcement operations should help to correct this draw-back. In administrative flexibility the new agreement embodies great improvements. In fact, it represents an ideal which may not be as fully reached with other commodities.

The existing Sugar Agreement, which was signed in London in May 1937, provides for the regulation of production to hold down stocks to stated limits; it limits exports to agreed quotas; it does not provide for fixed prices but allows the operating committees to influence prices by raising or lowering the export quotas. The Coffee Agreement, signed in Washington November 1940, limits production in several ways. It fixes export quotas but authorizes the Coffee Board to maintain coffee prices at reasonable levels, for both producers and consumers, through regulation of the quotas. The Rubber Agreement provides production control. It provides also for export quotas and for import control; in addition it provides for

some accumulation of stocks by the International Rubber Regulation Committee. Reserve stocks to protect the consumer in periods of shortage are not contemplated in the Sugar and Coffee Agreements. The omission reflects the feeling that there is a constant surplus situation with these commodities.

### Conferences on Cotton

The need of an international agreement with regard to the production and marketing of cotton is generally recognized. Governments of most cotton-producing nations have expressed their willingness to continue the discussion of the matter. Several international cotton conferences held in 1939, 1940, and 1941 did not result in any definite agreement; yet the exchange of views indicated that progress was being made. Cotton presents an unusual complexity of problems. The number of producing countries, the variety of conditions in these countries, the use of substitutes for cotton in consuming countries, and the recent expansion of cotton production in new areas make a set of formidable obstacles. Production costs and prices vary widely in the cotton-producing countries. Since cotton is not a food but a raw material and moves into international trade a second time as cloth, it encounters added difficulty in matters of trade balances and exchange. The belief is growing, however, that an international cotton agreement can be reached.

Producers and traders throughout the world are coming to realize that agricultural adjustments within a given country cannot be expected to yield their full benefits to either producer or consumer without the backing of international collaboration. Any country's plans may be suddenly upset by other plans in another country. Hence the only final alternative to international agreement is a general lapse into national isolation, with all the disadvantages that such a policy entails. Some approach to international economic balance is necessary if the evils of glut and famine are to be controlled. National differences in the yields of crops from year to year make constant adjustments necessary among countries as well as within countries.

It is now impossible to think of returning to the former condition of free competitive markets between nations; instead, we turn of necessity to economic adjustment, national and international. This idea is not the monopoly of autocratic and totalitarian countries. On the contrary, it is a genuine weapon of democracy. The core of it is free cooperation. We must manage our domestic affairs in the interests of producers and consumers in such a way as to facilitate widespread international collaboration.

## FOOD SITUATION IN EUROPE

Since the outbreak of war in 1939 the Department's Office of Foreign Agricultural Relations has followed developments in the European food situation, gathered information about food rations in Eurpean countries, and tried to appraise the actual levels of their wartime food consumption both absolutely and by comparison with pre-war standards.

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The interest of the Department in these problems is not merely academic. It is important to have a reliable picture of the current food situation in Europe. Food is vital in the belligerents' war effort, in their morale, and in the morale of the subjugated territories. Observation of the European food and agricultural situation may provide clues to post-war food requirements. Our farmers have a keen practical interest in this matter. The Government has a practical interest in it also in its capacity as trustee for Government-owned or Government-financed holdings of surplus stocks. Study of this problem may have bearing on agricultural-adjustment and storage-of-surplus policies in this country. Use of the information will depend, however, on the course of the war.

During the first year of the hostilities food conditions did not seriously interfere with the war effort, the health, or the morale of the belligerent countries In the United Kingdom up to the middle of 1940 there was not much restriction of food consumption below the normal. Not until the beginning of 1941 did the situation become strained. It does not yet appear that the general food situation in the United Kingdom gives any cause for alarm, though sharp restrictions have been imposed upon the consumption of meats, bacon and ham, fats, sugar, and cheese. There are acute shortages also of fruits and vegetables as well as of eggs and fish. In some respects the situation has somewhat improved in recent months as a result of larger food arrivals, including United States shipments under the lend-lease program. An increase in the allowances of fats and sugar and a comprehensive scheme of additional distribution of canned meat products and fish became effective in November.

Bread remains unrationed; it is available in unlimited amounts and, what is also important, at pre-war prices. The quality is good; and the people begin to be offered, at their choice, either bread of 85-percent extraction or their accustomed white bread fortified with vitamin $B_1$. Margarine, with the addition of vitamins A and D, has been made about equivalent physiologically to butter. Fluid milk was available in abundant quantity, and at reasonable prices, well into the fall of 1940, but sharp restrictions are now in effect for nonpriority consumers. Children and expectant and nursing mothers are particularly favored in the distribution.

Much has also been done to mitigate or to eliminate inequalities in food distribution, which, despite rationing, persisted as a result of the rise in prices and of differences in the purchasing power of different social groups. In the United Kingdom, since December 1939, the Government has subsidized on a large and increasing scale the prices of bread, meat, milk, and bacon so as to keep them within the reach of the lower-income groups. This system, of course, cannot be expected to work to perfection, but it has doubtless helped toward the ultimate goal of an assured minimum food supply for all. The higher physiological requirements of heavy workers are now being taken account of by the provision of one full meal a day in worker canteens.

### Rationing in Germany

In Germany considerable restrictions on food consumption have been imposed from the outbreak of the war. Virtually all staple

foods, except potatoes, are rationed, and the rations imply a considerable reduction in the consumption of such foods as meats, fats, and eggs. Rations of bread and sugar are liberal, and potatoes, an important item in the German diet, have been consumed in greatly increased quantity during the first 2 years of war. In recent weeks there have been indications that the authorities may find it necessary to ration potatoes and that the supply may not be as liberal as it has been in the past. Transportation problems seem to be the main difficulty. Fruits and vegetables during the first 2 years of war have been scarce, but the supply of vegetables was considerably improved in 1941.

The German rationing system is characterized by a very considerable differentiation in the rations for various consumer categories. Heavy workers, very heavy workers, people who work long hours or at night, and farmers receive extra rations, most of which are considerably larger than the rations for the so-called "normal consumer," the average adult in nonmanual or light manual work.

The privileged categories comprise a relatively large proportion of the population, and their rations are larger, partly on account of their higher physiological needs, and partly as a type of social compensation. Soldiers, of course, have a scientifically balanced army diet and appear to be very well fed. Children, as a rule, have lower rations than adults, but the children's rations too are relatively liberal. All whole milk is reserved for children and for expectant and nursing mothers. Skimmed milk is supplied to the general public in quantity.

Soldiers, workers, children, and farmers thus appear to be the favored groups in Germany. To the first three groups, moreover, synthetic vitamin C is supplied in widening scope. Bread, which seems to be of fairly good quality, is being milled to 85-percent extraction to provide as much vitamin $B_1$ as possible. Margarine is being fortified with vitamin A.

Although it is difficult to weigh properly the various categories in order to arrive at a general conclusion, it seems that the food situation in Germany during the first 2 years of war remained fairly satisfactory. At the end of the second war year it was certainly much better than at the comparable time in 1916.

Within the framework of a planned and centrally direced economy an effective system of food control existed even before the outbreak of the war. This system helped to maintain domestic agricultural production on a high level; shortages of labor, of draft power, and of some fertilizers have had less effect thus far than in the last war. Germany appears to be able to utilize its available food resources more effectively than any other country. Germany has obtained important supplies from the occupied countries, either for its military forces there or directly for shipment to the Reich.

A comparatively favorable food situation has been maintained in Denmark and Sweden, in Switzerland, and in Portugal. There are certain shortages and general rations in these countries, but supplies to consumers have so far been liberal. The factor limiting food consumption in these areas is not rations, but prices and the reduced purchasing power of the lower-income groups. Small 1941 crops in the Scandinavian countries do not augur well for the future.

### Conditions Dark in Many Countries

The remaining European countries present a darker picture. There are a number of restrictions, but a still tolerable general state of nutrition exists in the Netherlands and possibly in Norway. Conditions in France, however, range from fairly satisfactory in some sectors of the population and localities to serious in others. In Italy the food situation has been rapidly deteriorating of late. Conditions in Finland are unfavorable. A generally serious situation seems to exist in Belgium. Perhaps still more serious is the situation in the German-occupied Government General of Poland, where the Polish and Jewish populations suffer grave privations. Serious food conditions are also reported from Spain. The ravages of the civil war in that country and the general situation caused by the present war have greatly impaired food production and economic consuming capacity. As a result of the war and occupation Greece and parts of Yugoslavia have now been added to the European problem areas.

The reason for the unfavorable food situation over wide areas in Europe are various. In the countries that normally depend to a very large extent on imports, such as Belgium, Norway, and the Netherlands, access to foreign supplies has been drastically curtailed, if not eliminated. Finland in 1940 had a poor crop and lost an important agricultural province in the war with Russia. In France, as a result of the war, economic life was disorganized, crops in 1940 were much reduced, and some livestock and food stocks were destroyed. Moreover, German requisitions—either outright or in the guise of purchases—of food stocks, livestock, and draft horses have aggravated the food problem, not only in France, but also in the Low Countries and in Norway. Large numbers of French farmers and farm workers are prisoners of war in Germany.

Shortages of coal and motor fuel and of rolling stock, of which Germany has made large requisitions in France and other countries, have added to the difficulties of distribution and transportation and have contributed to regional inequalities and local distress. Land communications on the Continent are overtaxed. They must carry a heavy wartime load and also much traffic formerly carried by sea. Unemployment, high prices, and reduced urban purchasing power in some countries have worsened the inequalities of food distribution.

The outlook for the food situation in Europe depends largely on the course of the war and the actual outturn of 1941 crops about which little is known as yet. It seems that generally throughout Europe food reserves must be drawn upon and food-producing capacity increasingly taxed as the war is prolonged. The campaign in Russia for the present has eliminated the Soviet Union as a source and transit door for food supplies to the rest of the Continent. It is a formidable strain on Germany's resources, including the all-important transportation facilities. It is to be feared that in the deficit regions of European Russia now occupied by the German armies there will be serious want and distress this winter.

## OUR COOPERATION WITH LATIN AMERICA

In inter-American cooperation this Department pursues three main objectives. (1) It promotes cooperative research. In most Latin

American countries agriculture is just entering the scientific stage. These countries want the help of our technicians. They can get it now under an act (Public No. 63, 76th Cong., approved May 3, 1939) which authorizes the loan of exports to other American republics. (2) The Department cooperates in efforts to restore rubber growing in its native home in the New World. (3) With other public agencies the Department seeks to rehabilitate agriculture in the Caribbean area and elsewhere in the Americas, through surveys, recommendations, and technical assistance, on the basis of which our Government may extend long-term financial aid through the Export-Import Bank.

The war has gravely disturbed the economic systems of many Latin American countries and forced them to make extensive agricultural readjustments. They are working toward the production of a greater variety of export crops, particularly complementary crops that can find a market in the United States, and toward a wider diversificaion of crops for their domestic consumption. This Department, along with other Government agencies, is helping them in various ways to make the necessary changes. Besides research, the aid given includes technical and sometimes financial assistance. It deals with the economic problems involved, as well as with purely technical matters.

The livestock industry of Peru, which supplies mainly the Peruvian market, requires the grazing of animals at high altitudes, sometimes at elevations from 10,000 to 15,000 feet above sea level. At these high altitudes the reproductive powers of the animals decline. This country, at the request of the Peruvian Government, has sent a cooperative employee of this Department and of the University of Missouri to study the problem in collaboration with Peruvian livestock specialists. Livestock studies will be made similarly in Chile, Argentina, and Brazil in response to invitations from their governments. Specialists from this Department and from some of the State agricultural agencies are studying crop-destroying insects in Latin America. They are seeking methods to combat the white-fringed beetle, the fruitfly, the pink bollworm, and black stem rust. Such investigations are going forward particularly in Brazil, Argentina, and Uruguay. Our agricultural scientists are cooperating similarly with the Mexican Government in pest control work, especially in studies of the pink bollworm, and of black stem rust in small grains.

Our cooperative research with Mexico, because of the nearness of that country to us and because many of its agricultural problems are also ours, has reached an advanced stage. This country and Mexico have a treaty for mutual aid against infectious and contagious diseases of animals. It has resulted in a constant interchange of scientific information. Our specialists collaborate with Mexico's scientists in livestock sanitation, in animal husbandry, in cereal studies, and in disease-control work. This cooperation benefits both countries. It partly accounts for their freedom from certain livestock diseases that are widely prevalent elsewhere. Our specialists also collaborate similarly with growers and specialists in Venezuela, Colombia, and the Caribbean Islands in agricultural pest research and control and in many other phases of agricultural technology.

There is a broad program of cooperative research under way in tropical forestry. Specialists from the United States conduct the

tropical forest station at Rio Piedras, P. R. They seek an improved technical basis for tropical forestry throughout the American republics. Arrangements for additional cooperative forest research are being made in the Dominican Republic, Haiti, and Cuba. There is a plan to provide facilities at the Puerto Rico station for visiting scientists, and for a limited number of students from Latin America. This Department's work in many other branches of science has ramifications throughout the Americas. On the other hand, scientists from the other American republics are studying and doing research work here. For example, nine engineers from Latin America are taking a training program offered by the Rural Electrification Administration. Chemists from Argentina work on an internship-training basis in our regional research laboratories. They seek especially industrial uses for Argentina's farm surpluses. Common economic problems of North and South America are bringing the Americas closer together in research.

### Cooperation in Rubber Growing

Specialists from this Department are working with Latin American countries to revive especially their rubber industry. Rubber, of course, is native to the New World; yet today the New World does not grow it extensively. More than 90 percent of our own supply comes from other areas. Recent efforts to redevelop American sources began with surveys of a large portion of South America, Central America, southern Mexico, and the West Indies. Explorers from this Department visited all these countries. That rubber can be grown successfully in the Western Hemisphere is not in doubt. Chiefly the survey parties looked for the best locations. They found many that would be suitable for rubber plantations.

Along with the search for good growing areas is work in rubber-plant breeding. Our scientists and those of Latin America have assembled high-yielding and disease-resistant strains from all world sources. They are propagating the most promising strains. In several Latin American countries, the cooperating scientists are establishing tree nurseries of the Para rubber (*Hevea Brasiliensis*). Specially important work is going forward at a central rubber experiment station at Turrialva in Costa Rica and at propogation and budding stations in Honduras and Haiti. Among the objectives is the development of improved plantation procedure, of methods for distributing superior plants, and of facilities for diffusing scientific knowledge with regard to the production of rubber and the preparation of it for the market.

One problem is the transportation of selected seed to locations chosen for experimental rubber growing. In this task the United States Army has cooperated. It has helped to transport seed by bomber plane to selected lands in 12 of the Latin American republics. Arrangements are under way for special research in rubber diseases. In studies of this kind facilities of the central experiment station in Costa Rica are proving valuable. All American countries with rubber-growing possibilities are joining in the cooperative endeavor. Private concerns are helping too in research as well as in experimental rubber growing. They have assigned many of their em-

ployees to cooperate with the research specialists and with the survey parties. Also they have given demonstrations to encourage rubber planting by small operators. The rubber-development plan for Latin America does not neglect wild rubber resources. In the Amazon Valley there is a vast reservoir of wild rubber. Surveys and research will help producers to draw upon it effectively.

This work is all a very recent development. It dates from the passage of the Second Deficiency Appropriation Act by Congress on June 22, 1940, which appropriated $500,000 for cooperation with the American republics in rubber investigations. Some of the Latin American republics, such as Mexico, Costa Rice, Peru, Brazil, and Venezuela have themselves appropriated money for the cooperative rubber research. There are high hopes of getting substantial results.

Necessarily the enterprise is a long-time affair. Trees planted now will take from 7 to 10 years to yield rubber in commercial quantities. As an emergency operation we are starting the job 10 years late. It should have been started in the early 1930's. Had it been started then, we might be getting South American rubber in large quantities now at lower prices than those we pay for rubber from the East Indies. Still more important, we might have rubber available from sources not liable to be cut off by sea blockades. Nevertheless, the fact that we are late in starting the job should not deter us from pushing it.

There is no telling when the world will return to normal conditions of international trade. What type of world order will come afterward, we do not know. That it will justify dependence on distant sources of strategic raw materials is highly problematical. Among these materials rubber, of course, is vital. It is fortunate that we have an opportunity to develop an adequate supply of it near at hand, under conditions that will further the development also of inter-American friendship and economic unity.

## Assistance Given To Islands of Caribbean

The islands of the Caribbean are of great importance to the United States. As key outposts along the approaches to the Panama Canal, they are of immense strategic value. They should be in a sound economic condition, particularly in their agriculture. Engineers and workmen from the United States are building sea and air bases from Bermuda down to British Guiana. The Navy alone is spending more than 100 million dollars in the Caribbean and Panama Canal area. It is building docks, dredging harbors, and constructing barracks. This activity stimulates Caribbean agriculture and also makes demands upon it. Whatever strengthens the Caribbean economy strengthens also the Caribbean defenses.

This Department has long been interested in the agriculture of the Caribbean Islands, partly because of our dependence upon them for sugar and other crops. The Federal Agricultural Experiment Station in Mayaguez, P. R., develops facts and principles that have broad utility throughout the Caribbean area and also in Central and South America. The station cooperates closely with the Agricultural Experiment Station of the University of Puerto Rico. It has partici-

pated in various surveys of agricultural conditions in the Caribbean. Such surveys have laid the groundwork for extensive agricultural programs in some of the islands.

In May 1941, for example, this Government and the Government of Haiti agreed upon a concrete program based on agricultural surveys and researches. It provides for long-term cooperation. Central in it is rubber production, rounded out with increased plantings of bananas and subsistence crops. There is provision also for the development of oil crops, spices, drug plants, and fiber plants; for the improvement of cacao production; and for the rehabilitation of Haiti's forest resources. It includes, besides, an effort to stimulate small handicraft industries. The program will be under the direct supervision of a Government-owned corporation.

Agricultural technicians of this Department collaborated with Haitian officials in laying the basis for it. The program will not change the Haitian pattern of land ownership. On the contrary, it will strengthen and extend the system, in which small farmer-owned farms predominate. Within this pattern the Government corporation will exercise broad powers and do many things to develop the natural resources of the island republic. On its own plantations it will itself grow and process agricultural products. In both local and export markets it may buy and sell various kinds of crops. The research that laid the basis for this program took several years and enlisted the cooperation of several of the Department's bureaus.

Contracts between the corporation and the farmers will stimulate the production of rubber, cacao, and other products. The corporation will furnish seed, provide technical supervision, and agree to purchase the crops harvested. Land holdings of the corporation will be limited to its central plantations, which will be devoted largely to demonstration and experiment purposes. They will employ only labor recruited in Haiti. Plantings by the corporation will include about 7,500 acres of rubber and 6,500 acres of bananas. Eventually, the corporation expects to grow nearly 70,000 acres of high-producing rubber trees. The Export-Import Bank is financing it.

This program contemplates close and detailed cooperation with the United States. It affects most of the agricultural products that can be grown in Haiti. It draws in consequence on a great variety of this Department's services. Moreover, by making Haiti less dependent on a few staple crops it will increase the buying power of the Haitian people. The United States also will benefit. Potentially the market in Haiti for manufactured goods and processed agricultural products is large. When the people have the means of payment, they will take increased quantities of clothing, machinery, flour, and lard. Many of the Haitian products that the program seeks to develop will find a ready market in the United States, particularly rubber, oil crops, spices, drug plants, and fiber plants. Similar programs may be developed eventually for other countries in the Caribbean Sea.

### Farm Readjustment in Cuba

Cuba's sugar output has shrunk from an average annual total of more than 5,200,000 short tons during the period 1924–30 to a current

level of about 2,700,000 tons. This year 400,000 tons of the currently available production, which represented a reduction of 16 percent from the average of the preceding 4 years, seemed likely to find no market. The Cuban people had two alternatives. One was to let the cane for these 400,000 tons of sugar remain unharvested; this would have aggravated the unemployment created by previous crop curtailments. The other was to harvest it in the hope that the sugar made from the cane might be in demand eventually to fill shortages created by the wartime dislocation of ocean shipping.

With financial assistance provided by our Export-Import Bank, Cuba chose the second alternative. It could not obtain the necessary financial help from other sources. The arrangement with the Export-Import Bank included a 5-year loan, at the rate of 1.23 cents a pound, secured by the sugar itself plus certain special Cuban imposts. This loan financed the production, storage, and eventual disposal of the 400,000 tons of sugar. The sugar is to be disposed of at the rate of not less than 50,000 tons a year, and at a price of not less than the amount loaned per pound. Essentially, the loan is a mortgage on the proceeds of future shipments of Cuban quota sugar for the United States market. Temporarily the agreement alleviated an acute unemployment situation in Cuba.

Its short-term character, however, directed attention to the problem of long-term Cuban rehabilitation. Agricultural specialists from the United States helped with a survey undertaken at the request of the Cuban Government. They represented the fields of soil conservation, irrigation engineering, tropical agriculture, and agricultural economics. Among the subjects to which they gave special attention were the development of irrigation works in Cuba; noncompetitive export crops; subsistence crops; public roads; and rehabilitation needs of impoverished small farmers and unemployed rural laborers. The report outlined a general rehabilitation program. Negotiations now in progress may lead to the granting of a developmental loan to Cuba by the Export-Import Bank. Similar agricultural surveys have been made in Colombia, Ecuador, Paraguay, Peru, Honduras, and Mexico.

### New Department Agency for Inter-American Work

As part of its program for promoting inter-American cooperation, this Department last year established a Division of Latin American Agriculture in its Office of Foreign Agricultural Relations. The Division concerns itself actively with scientific, economic, and trade phases of the rubber-research program. It pays great attention also to the development of other complementary noncompetitive types of tropical agriculture in this hemisphere. It cooperates with the Export-Import Bank in loan programs which that institution develops to stimulate agricultural production in the Latin American republics, and with other branches of this Department in the general organization of inter-American agricultural research. In addition, it works with the Department of State and with other agencies of the Government in fostering economic cooperation among the countries of this hemisphere, and makes contacts also with private individuals and firms that interest themselves in the same objective.

## PREPARING POST-WAR FOREIGN-TRADE POLICY

Our farm program has been organized so as to assure farmers of stability in the immediate post-war period, provided Hitler is defeated. Looking further ahead, however, the program will have to deal with the condition of our farm export trade. Our ability to find markets for the crops we produce in excess of domestic requirements will affect the entire agricultural readjustment.

It seems probable that for several years after the war ends there will be a large demand for foodstuffs to prevent starvation in Europe and perhaps elsewhere. It may last until agriculture in the war-stricken countries gets back to normal. Relief requirements in this period may exceed the commercial demand. The relief organization will probably be international, with the United States and the United Kingdom taking the chief responsibility. Only through such an organization could available food resources be mobilized effectively and limited shipping facilities used efficiently.

Meantime our farmers will be anxious about the longer future—about the prospects for commercial trade. As mentioned already, our agricultural exports have been declining for years. In 1931 their value fell below 1 billion dollars for the first time since 1909; in no year since 1931 have they approached the billion dollar figure, though as a result of lend-lease shipments they may do so in 1942. The percentage of our agricultural as compared with our total exports likewise has declined. It dropped below 50 percent for the first time in 1911 and has continued to decline. In 1938 agricultural exports represented in value less than one-fourth of the total exports, and the proportion for 1940–41 was about one-tenth. Some difficult problems must be solved if we hope to resume agricultural exports even in the relatively small amounts of the years before this war.

We cannot expect indefinitely to export the kinds of foodstuffs that we are shipping under the lend-lease program. Relief needs for protein foods may serve as a cushion for a time when lend-lease shipments stop; but other countries will ultimately be able once more to sell dairy and poultry products in continental Europe at lower prices than ours. Further, this country has reason to hope that Europe will turn to increased production of dairy and other protective foods and away from such crops as wheat. To the extent that we can resume them after the war, there is little doubt that our commercial agricultural exports will consist mainly of wheat, cotton, tobacco, pork, and fruits, just as they did in pre-war years.

### The Problems of Payment

The chief obstacle is the lack of foreign exchange in many countries that might import our agricultural products. This has been a problem since the 1920's. We have met it in the past by loans and gold purchases, but both these solutions are of a rather short-term nature. The exchange situation will probably be worse after the war. The United Kingdom, one of our chief markets, will not be in as strong a creditor position as it was formerly, and our own position as a creditor nation will be still stronger.

Apparently the only solution is for us to build the kind of trade which will exchange our products for goods and services that we can use, in such a way as to establish an approximate balance of exports and imports. It envisages a continuation of something like our reciprocal-trade-agreements program, and is fully consistent with our program of fostering the development in Latin American countries of products complementary to our own. It may not be easy to work out a more liberal import policy for the United States, but farmers are not the only group interested in having such a policy. Most groups stand to benefit in the long run from action that will promote rather than inhibit trade.

## Our Price-Supporting Problem

Another major difficulty is the fact that the agricultural policies which have done so much to sustain farm incomes in the United States have the effect simultaneously of raising the prices of many of our export crops to levels well above world prices. This makes difficulties for us in the world market. For the time being, we may not appreciate them fully, because the war is a still greater handicap to normal export trade in farm products. But when the war stops we shall realize keenly that price adjustment for the export crops has special requirements.

One way of meeting the difficulty after the war would be to let our prices fall to levels at which we could compete in the world market. This solution, however, would be unsatisfactory to agriculture. Another method, which we have used to some extent already, would be to subsidize farm exports. Still another method would be to change our farm programs so that domestic prices would be held at suitable levels by domestic marketing quotas, export prices would be allowed to fall to competitive levels, and supplementary benefit payments to maintain farm incomes would be made to farmers. There is finally the possibility of resuming a program of processing taxes, from which benefits would be paid to farmers, contingent upon their holding acreage of surplus crops within properly determined limits.

The last three solutions have a common objective: Establishment of a two-price system—a regulated domestic price and an export price allowed to rise and fall with world prices.

It should be recognized that the ultimate success of such a plan would depend in part on the ability of exporting and importing nations to stabilize world markets, especially for crops which have been chronically in surplus, so that world prices could be maintained at reasonable levels. Methods being sought to achieve this stabilization have been mentioned already in this report.

## Study Needed To Guide Policy

Considerable thought and planning will have to be devoted to these various possibilities. The alternative for us is to accept an increasing degree of economic isolation, with reduced imports and exports and a struggle to become more and more self-sufficient. Such a course is not consistent with our present foreign policy or with

our desire to promote greater cooperation among the nations. If we intend to work for a post-war world relatively free from destructive rivalries we can hardly accept a situation which tends to isolate us.

It is true that we are tending to decrease the production of our surplus crops in favor of protein and protective foods and that after the war we hope to continue this tendency and thereby to raise our nutritional standards. In all probability, nevertheless, we shall still have more acres in crops such as cotton and wheat than we need for our own requirements. Lack of an export market for the surplus will involve us in extremely difficult farm readjustments.

These are two extreme forms which world organization might take after the war. The first would be a world divided into two or more tightly organized and hostile blocs, each striving for control of world resources and markets. The emphasis would be on self-containment and isolation. Each bloc would strive to produce within its borders everything which it needed, and to minimize its dependence on imports. This is the kind of world we may expect if the war ends on any basis other than the defeat of Hitler. It offers little hope of lasting peace or of progressively higher living standards in any nation.

At the other extreme would be a world in which economic and trade barriers no longer existed, the ideal world of the free traders. In it each nation would produce within its borders only what it could produce cheaper than it could import. World exports of commodities would originate in the areas best adapted to producing each of them. For a number of reasons we cannot expect to attain this ideal. Perhaps the most important is the fact that virtually all Governments have assumed an increasing degree of control over imports and exports and are not likely to relinquish it. But the controls need not continue to be used restrictively as for the most part they have been used in the recent past. They may be used to organize and foster a steadily increasing flow of trade throughout the world. Under peace terms written by the democracies, Governments could use their powers to minimize the conflicts of economic interests, and to work toward and not away from world cooperation.

## AGRICULTURE'S REQUIREMENTS FOR DEFENSE PRODUCTION

Agriculture, like any other industry, is feeling the pinch of defense priorities. This is true though high defense officials regard agriculture as "semimilitary" and the President has described food as "a weapon just as much as munitions." There simply is not enough of the strategic metals to go around after meeting armament and vital civilian needs.

Priorities clamped on aluminum, alloy steels, copper, zinc, lead, and other metals had an immediate effect on the production of farm equipment. These metals normally enter into the manufacture of milking machines, poultry equipment, steel grain bins, farm machinery in general, and scores of other farm items, such as galvanized waterbuckets, pressure cookers, metal roofing, wire fencing, nails, and steel fence posts.

As the priorities list grew, other orders affected chemicals for fungicides, insecticides, and fumigants, and drugs for animal medicinals and biologicals. Orders of a general nature, such as those that restrict the use of copper and limit the production of trucks, also had a direct effect on agriculture.

The Department through its Office of Agricultural Defense Relations has endeavored to have the priority ratings take agriculture into consideration. When priority officials began to issue blanket-type priorities for essential industries, the Department joined with manufacturers in requesting ratings for farm machinery, equipment, and supplies that would give these things a claim after strictly defense orders. Such preference ratings were issued and proved of great importance, though some of them were temporary and others were superseded by other methods of apportioning strategic material.

Two of these early preference orders constituted the farm machinery- and equipment-rating plan.

One of these orders, effective for a 3-month period, assigned a defense rating, A–10, to deliveries of materials necessary for the production of parts for the repair and maintenance of existing farm equipment. The other, effective for a 5-month period, assigned the highest civilian rating, B–1, to materials needed for the production of new farm machinery.

But it soon became apparent to the Department and to defense officials that the temporary orders, with relatively no preference ratings and no limitation on production, were not sufficient. So many ratings had been issued that there were not enough metals to go around. Consequently the priorities officials worked out a plan to provide agriculture with the maximum number of farm machines possible, through a priority rating high enough to secure materials for the farm machinery industry.

Consequently, a plan was worked out whereby a stated tonnage of metals was allocated for use in the manufacture of new farm machinery. The agricultural machinery industry was the first of the major manufacturing groups to be given assistance under the allocation system.

As a basis for determining the amount of machinery to request, the USDA defense boards made a survey of etsimated new farm-machinery needs for 1942. The survey showed that farmers estimated their needs for 1942 at 107 percent of the tonnage used for farm machinery in 1940. The Department asked the Supply Priorities and Allocations Board for a rating high enough to guarantee adequate farm machinery production.

While the Department was presenting this figure to priority officials, the Government decided to double our tank-production program, to increase the air force, and to make other step-ups in our armament. This program further decreased the amount of metals that can be used for civilian needs, even vital ones such as food production. As a result, the priority officials fixed the allocation of metals for 1942 new farm machinery at 80 percent of the tonnage used for the same purpose in 1940.

The new plan may partly offset the sharpness of the reduction by establishing a rating which will actually provide metals to the farm-

machinery industry. Moreover, the plan makes it possible to see that the metals available go into the farm machinery most needed.

Obviously, the reduction in the new farm-machinery supply will make fulfilment of the 1942 farm goals more difficult, particularly where shortages of farm labor especially prompt a shift to machinery. In spite of this and other handicaps, the Department and its field staff believe that the 1942 production goals will be met.

One factor in this belief is an understanding reached with priority officials that enough metals will be provided for the manufacture of repair and replacement parts for agricultural machinery.

The machinery now on farms was used in 1941 to produce one of the largest crops on record. The bulk of this same machinery, if repair and replacement parts are available, can be put in shape to make the 1942 crop. There will, undoubtedly, be local difficulties, but on a national scale the production goals will probably be met, provided the seasons are not unfavorable.

In late October the Department launched a Nation-wide farm-machinery-repair program to help farmers meet the prospective reduction in the supply of new farm implements. The Secretary directed the USDA defense boards to assist farmers in a program to repair their farm equipment during the coming winter.

The Department also worked on farm hardware, bale ties, supplies for rural repair and blacksmith shops, and irrigation equipment. These were not covered by any blanket orders. It presented information about these supplies to the Office of Production Management, which thereupon included supplies for rural repair and blacksmith shops and for irrigation equipment in its repair and maintenance order. It included farm hardware in its warehouse order. Bale ties were handled by OPM directly with the steel mills. Successful efforts were made also to get adequate supplies of milk pails and milking machines so that they might be available in time for the spring flush season.

Agriculture's supply problem, however, does not stop with the farm. It includes materials necessary for the processing, packaging, and storing of farm commodities. Accordingly, committees of Department experts studied these requirements and suggested priorities to facilitate new construction and expansion of processing and storage plants. In addition, the Department undertook surveys on more than 20 processing and packaging industries associated with agriculture so as to be in a position to advise OPM as to future needs and also to find ways of conserving critical materials.

The Department is represented on the Labor Supply Committee. This body consists of officials from all the Government agencies that have to do with supplying labor for defense. The Department has representatives also on 12 regional labor supply committees. By request it has advised the Selective Service System of the farm skills, the types of farm production, and the rural areas that have most significance in the food-for-freedom program. It has helped in this way to standardize agricultural deferment procedure with advantage to the farm-production program. In addition, it has worked with other agencies to improve the farm placement service. It has cooperated also with the Works Progress Administration, the National Youth Administration, and the Civilian Conservation Corps in programs for

training farm skills, developing wider defense employment of women, and making more efficient use of manpower.

The defense emergency affects the agricultural labor situation in various ways, especially in drawing hundreds of thousands of defense workers and soldiers from the farms. The Department has drawn the attention of other Government agencies to the resulting farm difficulties. It has pointed out, for example, that while the problem of providing labor for the farms is not as dramatic as that of supplying skilled mechanics for bomber production, it is just as urgent. Moreover, it is as closely related to the defense program. There is now a more general understanding of the farm labor problem in the defense emergency. In some parts of the country it appears that Federal action will be required if the labor needed for increased production is to be made available. In areas where large seasonal demands for labor can no longer be met, it may be necessary to organize community harvests or other community action. Higher prices and farm income in 1942 may also permit farmers to compete more effectively for labor by increasing farm wages.

Agriculture has defense transportation problems. The Department is cooperating with the railroads and other transportation agencies in efforts to solve them. This year's bumper grain crop has emphasized the value of such cooperative procedures. It has been possible thus far to meet agriculture's transportation needs, not only in the United States but also in intercoastal and off-shore shipping. The Transportation Division of the Office for Emergency Management, the Maritime Commission, and two Emergency Shipping Committees have facilitated the cooperative endeavor.

As described in more detail later, the Department has dealt also with the storage problem. It has helped in the expansion of the storage industry and in the strategic location of new storage facilities. It has made a special study of marketing methods with a view to the saving of transportation and storage space.

Through contacts with the Army and Navy and other defense agencies, the Department has helped to establish broad views of agriculture's defense needs. It has also presented these needs to action agencies within the Department, especially the committees responsible for determining the food-for-freedom goals. Through representation on the Plant Site Committee and through contacts with the Army and Navy it has influenced the location of new defense facilities in rural areas, notably in areas that have a surplus of labor. It has recommended that defense plants should not be located on highly productive agricultural land except in cases where other suitable sites cannot be obtained.

Farmers may have difficulty next year in getting fertilizers, bagging and other containers, chemicals for insect and disease control, fuels, electric power in some areas, electrical equipment, storage and warehouse space, transportation, and other essentials in the production and handling of farm products. Restrictions in supply are being felt already in fencing, galvanized sheets, nails, iron pipes, and some other items.

Some type of priority rating, allocation, or blanket order has been granted by priority officials to meet farm needs in virtually all of the fields in which agriculture has an interest. For example, there is a

warehouse-preference rating plan which includes a large number of ordinary merchant-type farm needs, such as nails, galvanized roofing, and similar items. There is a health-supplies plan; it includes animal medicinals and biologicals and veterinary needs. Another priority plan protects agriculture's needs of fungicides, insecticides, and disinfectants.

The Department serves a double function in the priorities field. It studies the supply problems of the farms and of the allied agricultural industries, and makes recommendations to OPM. For example, the manufacture of explosives and the export of munitions to the United Kingdom have sharply reduced the supplies of almost all the chemicals used by agriculture in fertilizers, insecticides, fungicides, and fumigants. After studying the requirements, the Department succeeded in having amounts set aside for agriculture, either by priority action, by mutual agreement among defense agencies, or by direct appeal to manufacturers.

## ORGANIZATION TO HANDLE THE DEPARTMENT'S DEFENSE RELATIONS

With the passage of the Lend-Lease Act it became evident that each day would set new tasks for farmers. Demands for an immensely increased farm output in some lines, along with restraints in other lines, posed new tasks also for the Department. As the center of the action programs, it was logical that the Department should take over the defense relations task also.

This change came about on May 5, 1941, through a letter from the President to the Secretary of Agriculture which transferred to the Secretary the agricultural functions previously assigned to the National Defense Advisory Commission. The letter requested the creation of an Office for Agricultural Defense Relations within the Office of the Secretary. This new unit does not administer any of the farm programs. It does not in any way supersede the Agricultural Adjustment Administration, the Soil Conservation Service, the Farm Security Administration, the Surplus Marketing Administration, the Rural Electrification Administration, or the older branches of the Department. Essentially it acts in a planning, advisory, and policy-making and liaison capacity, especially in relationships between the Department and other national-defense agencies. Problems fall to it under four related through distinguishable fields: Production; farm equipment and supplies; labor and rural industries; and transportation and marketing.

### Four Divisions in OADR

Four divisions have been set up in OADR to deal with these matters. Among the tasks of the Production Division is the determination of agricultural requirements for the Army and the Navy, for defense industries, and for various Government agencies. These requirements include food, fats and oils, cotton, wool, and other agricultural fibers, forest products, certain drugs, and leather. It is the Production Division's job, in consultation with the Department's action agencies, to arrange for the fulfillment of these primary defense demands and also to work with the Bureau of Agricultural

Economics and other units of the Department in defining farm production goals broadly, with lend-lease and civilian needs in mind as well as the need of our armed forces.

Conversely, the Farm Equipment and Supplies Division is concerned with what agriculture has to have in its defense effort. Especially, it needs machinery; facilities for processing farm products; various building materials; chemicals for agricultural uses, such as fertilizers, insecticides, fungicides and disinfectants; materals for bagging and packaging; and petroleum products. In some of these lines farm needs conflict with Army and Navy needs. What agriculture should have depends on what agriculture should produce. Food fibers and other agricultural commodities are defense weapons, of course, just as truly as are munitions. But what it takes to provide them is a matter that requires very careful study. Frequently, in presenting agriculture's claims, the Farm Equipment and Supplies Division has to do educational work.

The Labor and Rural Industries Division is responsible for liaison with bureaus of the Department of Agriculture and with other governmental agencies in developing plans to meet problems relating to (1) the demand and supply of farm labor, training of agricultural workers, housing and transportation of workers; (2) the development of general-welfare programs, health and medical care, continuity of employment, and similar items for farm workers; and (3) those problems arising from the location of defense industries and military establishments in rural areas.

One of the important functions is the development of plans to care for and relocate farm families displaced through the acquisition of their land for defense sites. This Division develops plans and procedures with the Selective Service, the Employment Service, the Office of Education, Office of Production Management, and similar agencies. It works toward a unification of the programs of agencies responsible for particular phases of agricultural-labor and rural-industrial problems.

The Transportation and Marketing Division of the OADR is concerned with coordinating the agencies of the Department with the activities of farmers and others in using efficiently the existing railroad, water transportation, and motortruck facilities for transporting agricultural products; in facilitating the use of all storage capacity available for handling the large production and carry-over of grains and other commodities, as well as assisting in obtaining new grain storage capacity for farmers and commercial handlers; in developing plans for the conservation and substitution of packaging materials for farm products and commodities which farmers use; and, in analyzing marketing and distributing problems so as to be in position to suggest helpful action if emergencies should arise.

## SPECIAL DEFENSE FUNCTIONS IN THE DEPARTMENT

As part of the National Defense Program the Department has expanded some of its activities and undertaken many new ones. In fact, defense involves almost every detail of the Department's work. Some of the tasks are: (1) Assisting agriculture to provide adequate supplies of farm and forest products; (2) aiding consumers to win

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better health through better nutrition; (3) collaborating with other Government agencies in providing critical and strategic raw materials; (4) developing substitutes for imports that the war reduces or cuts off; (5) finding new defense uses for farm and forest products; (6) assembling data useful in locating new defense industries; (7) dealing with price relationships in the defense economy; (8) aiding defense agencies in locating, acquiring, and servicing new military establishments; (9) assisting in plans for economic defense; and (10) promoting hemispheric solidarity.

This report treats some of these activities in detail; others, for lack of space, it discusses only briefly. It is useful to glance at the Department's whole defense job, because it is of surprising extent and variety. Primary in it is the effort to assist farmers in streamlining their production so that things needed for defense will be available and surplus crops will not pile up inordinately. The Department endeavors especially to aid farmers in converting reserves of feed into animal products and in increasing the output of certain vegetable crops.

To facilitate this operation the AAA modifiies its regulations and brings the new provisions to the attention of farmers through community and county committees. New educational responsibilities rest also on the Extension Service. Necessary fiscal arrangements create additional work for the Commodity Credit Corporation, for the Farm Credit Administration, and for the Farm Security Administration. Arranging for a better distribution of the farm labor supply enters into the task.

Efforts to stimulate defense production make heavy calls on the Department's statistical services. Facts about current and prospective needs have to be abundant and up to date. Special studies have to be made regarding storage, transportation, fertilizers, and farm machinery. Shortages of all these things have to be surmounted or endured. Special surveys as to fats and oils, which ordinarily we import heavily, are necessary to guide plans for greater domestic production as an offset to the shipping crisis.

The Department is doing what it can to increase the wood supply for defense. It is augmenting the output from the national forests and cooperating with private-forest operators. Action against forest fires has new importance. Limiting the destruction and deterioration of forest resources is an urgent defense requirement. Because in some defense uses Sitka spruce is irreplaceable, the Forest Service has surveyed all the areas where it grows, and now has full knowledge of the available sources.

As told elsewhere in this report, under the lend-lease program the Department helps to provide food for Great Britain. This duty specially concerns the Office of Foreign Agricultural Relations and the Surplus Marketing Administration. It is a job of infinite complexity. Food buying under the Lend-Lease Act has to be synchronized with food buying for our own military and naval forces, and also with food buying for the Red Cross for relief distribution. Obviating gluts and shortages and prices difficulties is part of the task, which sets many new problems for the Department's technicians as well as for its economists and market specialists.

## Food-Buying Has Many Aspects

Subsidiary aspects of the food-buying program are numerous. For example, the Bureau of Home Economics helps the Red Cross in working out food lists and specifications. The Bureau of Agricultural Chemistry and Engineering is working on a method of preserving liquid eggs without refrigeration, with the special object of making supplies more readily available to the British. Various agencies of the Department collaborate in handling problems of food shortage. There is of course a vital connection between storage and transport problems. Transport shortages increase the call for storage on farms and in granaries and warehouses. Providing additional storage is more than a question of labor and materials. It involves farm credit, farm price policy, and skillful handling of goods in and out of storage places. Especially important is wise management of the Ever-Normal Granary, so that supplies can be distributed from it with maximum stimulus to defense production.

Better use of food for health calls for many-sided collaboration among the Department's specialists. It enlists especially the services of the Bureau of Home Economics, the Surplus Marketing Administration, and the Extension Service. Representatives of these agencies serve on planning committees of the national nutrition campaign. They help farm people to produce more meats, fruits, and vegetables for themselves. As described elsewhere in more detail in this report, the Department's nutrition campaign deals with food requirements and uses, vitamin values, family spending, and the proper combination of foods in the diet. Getting national strength from food is a problem also in income distribution. Through relief distribution, the food-stamp plan, school lunches, and low-cost-milk programs, the Department brings food and needy people together.

Economists in the Bureau of Agricultural Economics, in the Office of Land Use Coordination, and in other agencies of the Department cooperate with the National Defense Advisory Commission on the selection of locations for new defense industries.

## Accumulating Strategic Materials

Programs to accumulate critical and strategic materials create many jobs for the Department. They start with economic surveys to determine requirements and sources of supply. Surveys on wool and wood pulp, on fats and oils, on rubber, and on fibers such as flax and hemp are typical. Another phase of the work involves international trade occasionally through barter. For example, the Commodity Credit Corporation has arranged exchanges of cotton for rubber and tin and of wheat for coffee. Specialists in the Bureau of Plant Industry and in the Office of Foreign Agricultural Relations search the Western Hemisphere especially for existing or potential supplies of strategic materials. These agencies are assisting in rubber-development plans in Latin American countries and in programs for increasing the production there of quinine and abaca hemp and numerous other complementary products. The Forest Service is trying to locate supplies of general lumber in Mexico and has determined that Nicaraguan pine is suitable for use in shipways.

Commodity-substitution problems created by the war concern the Department. Chemists and engineers are looking for a substitute for zinc in farm building materials and equipment. Chemists and entomologists are trying to develop substitutes for imported insecticides. Plant specialists are trying to develop the domestic production of morphine; foreign supplies have been interrupted. Economists and fiber specialists are working at the problem of substituting cotton for jute and wool in various uses. Even the need to conserve aluminum creates problems for this Department. It calls on home economists, for example, to report on the suitability of other metals in cooking utensils. The need to conserve tin may affect home canning; if so, the Department must be in the forefront of the search for substitutes.

## New Uses for Farm and Forest Products

In the never-ending search for new uses for farm and forest products, defense requirements introduce new urgency. Scientists in the Department are working on the treatment of cotton to make it a durable material for use in sandbags and military fabrics; on the use of cotton lint for nitration; on the fireproofing of baled cotton; on the possible usefulness of baled cotton as an insulation against bullets and shell and bomb fragments; on the use of cotton plastics in black-out shades; and on the use of cotton fabrics as black-out cloths. Rosin oil, a naval stores product, has a use in gas masks for animals; turpentine is useful in making smoke screens. Naval stores products enter into flame thrower fuels. In this field the Bureau of Agricultural Chemistry and Engineering plays a role. Scientists of the Department are developing camouflage materials from plant bases, methods of dehydrating vegetables, improvements in refrigeration and storage, and other procedures with military applications.

There is a long list of military uses for forest products. Foresters are studying the possible uses of wood as a substitute for aluminum in training and combat planes. They are investigating the use of wood cellulose for nitration into explosives and the use of charcoal in gas masks. Other forest-product research with important defense applications has to do with glues and gluing problems; with wood plastic and plastic wood; with the fire resistance of wood structures; with wood as a substitute for raw cork for shell-closing plugs; with the use of Brazilian bark as a substitute for ground cork; with painting, finishing, and preservation problems; and with the seasoning and bending of oak for ships.

In the Department's chemical laboratories work is under way on mustard gas decontaminants. Men in the Soil Conservation Service assist Army officials in dealing with problems connected with land to be used for camps, ranges, and air fields. Specially necessary are data on soils, drainage, and water-supply conditions. Some military sites have been located on publicly owned land managed by this Department. The Forest Service and the Soil Conservation Service negotiate necessary transfers. Officials of the Forest Service, of the Soil Conservation Service, and of the Farm Credit Administration assist defense agencies when privately owned land must be bought for military sites. In many cases officials of the Department actually do the land buying.

## Engineering Aids To Armed Forces

The grassing of military air fields occupies one group of the Department's scientists. Camouflage use of plantings occupies another group. Fixation of soil to prevent erosion and protect water supply calls for the services of still another group. The provision of electric power for military establishments calls frequently on the services of the Rural Electrification Administration. This is often a very complicated operation. It involves the help of REA engineers and scientists on specifications for camp current supply. Sometimes the REA negotiates with private power suppliers for the distribution of current by REA systems to military camps. It has to see also about the provision of mobile generators for use when central-station power fails.

There is a many-sided call on the Department's services for the protection of buildings and stored materials at military establishments. For example, insect damage to food supplies, fabrics, and structures has created much new work for the Department's entomologists. There is work for the meat-inspection services; for the grading services on food purchases; for the food specialists in helping to draw specifications for emergency and general rations; and for the Department's specialists in market supplies and prices. The Department advises the Quartermaster General on specifications for the turkeys to be bought for army messes. It tells the army authorities how much vitamin A should be provided in the rations for flying officers so that they will not suffer from night blindness. These are just samples of the details in the feeding of the Army and Navy that set tasks for the Department. All told there are many thousands.

Cartographers in the Department assist the Army and Navy; they provide maps already made and make new ones. The AAA, the SCS, and the Forest Service have photographed most of the United States from the air. Land use maps prepared in the Department for erosion-control and flood-control purposes have numerous military uses. Military men make extensive use of the photographic files. The Forest Service supplies data on parachute jumping with fire-fighting equipment; on the use of portable light radio sets; on the use of heavy equipment in mountainous, forested regions; on the charting of areas in the national forests for maneuver purposes; on the development of aircraft-warning systems based on forest lookout points.

## Our Economic Defenses

In the field of economic defense the Department assists with information about the agricultural resources of various countries; with help in operating the export-control system; with a detailed and constant survey of Europe's food and feed resources; and with economic studies of price-control systems, trade barriers, strategic commodities, and with analyses of trade relationships in general. It has provided other Government agencies with detailed reports on the agricultural economies of specific countries and with detailed reports on countries from which the United States draws important military materials such as rubber and tin. It has published studies of the agriculture of the Dutch East Indies, British Malaya, Russia, Japan, China, and many other agriculturally important countries.

In the program for pan-American cooperation the Department takes a prominent part, since agricultural relationships are basic in it. Elsewhere this report gives details of the movement to develop supplementary agricultural and forest production in the countries to the south of us. This movement enlists the Bureau of Agricultural Economics, the Bureau of Plant Industry, the Office of Experiment Stations, the Office of Foreign Agricultural Relations, and the Forest Service. The Department participates in the negotiation of trade agreements with countries of the Western Hemisphere. It cooperates with the Export-Import Bank and with the Office of the Coordinator for Commercial and Cultural Relations with the American Republics.

Equally important in the drive for Hemisphere unity, the Department does educational work in the United States. It supplies farm people especially with information about the people and the problems of the other American nations. This job goes on actively through the Agricultural Adjustment Administration, which keeps its 100,000 committeemen informed constantly about inter-American problems and developments.

## LOCATING DEFENSE INDUSTRIES AND MILITARY AND NAVAL RESERVATIONS

In connection with the location of defense industries as a part of the National Defense Program, the Department has a dual role. As part of the National Government, it has to contribute to the defense undertaking. The production of war materials, which include food and fiber, and the training of men in utilizing weapons, have precedence. At the same time, the Department has special responsibilities toward agriculture and rural people. This involves not only assisting rural people to make their maximum contribution to defense, but also assisting them to take advantage of opportunities afforded by the defense program to improve the condition of agriculture and minimize adverse effects of the war and its aftermath upon the rural economy.

As a general policy, the Department has encouraged the spreading of sites for defense industries and for military and naval uses southward and westward into areas of surplus population and away from earlier concentrations in the Eastern States and metropolitan centers. The cooperation of the Department with the OPM Plant Site Committee and with officials of the War and Navy Departments has been successful in pushing out recent allotments of defense sites into rural areas. The purpose has been to give better balance to our national economy, to utilize more fully the resources and potentialities of certain areas, and to avoid some of the social problems that attend mass migration of workers and industrial concentration.

In accordance with this general policy, large areas of land in various parts of the country which were under the control or jurisdiction of the Department of Agriculture have been made available for defense use. Some of these lands have been transferred outright to the War Department. In other cases use permits have been granted under which the Department of Agriculture retains title to the land. When the emergency is past, it is expected that such land will be returned to the use of the Department.

As of the close of the fiscal year, approximately 600,000 acres of Departmental land had been made available for defense uses, in addi-

tion to blanket permission being given to the War Department for the use of all southern national-forest areas for maneuver purposes. The largest single transfer was 345,960 acres in the Choctawhatchee National Forest in Florida. This land, previously administered by the Forest Service, will be used by the War Department as a bombing range. Other lands under the jurisdiction of the Department transferred to or authorized for use by the War and Navy Departments include the following:

1. Use permit to the Armory Commission of Alabama on 25,000 acres in the Soil Conservation Service Pea River project for use by the Alabama National Guard.
2. Use permit to the War Department of the Soil Conservation 9,000-acre Lakelands Flatwood Project in Georgia as an arterial gunnery range.
3. Use permits to the War Department in the Kisatchie National Forest, Louisiana, for the following projects:
(a) Catahoula division, 1,754.63 acres, and 3,409.73, for use as extensions to Camp Livingston.
(b) Catahoula division, 225 acres for use as bombing target.
(c) Evangeline division, 2,948.25 acres, and 12,609.85 acres, for use as extensions to Camp Claiborne.
(d) Vernon division, 11,000 acres for use as an artillery range.
(e) Vernon district, 32,560 acres, location of Camp Polk, cantonment and maneuver grounds for armored division.
4. Use permit on 600 acres of Soil Conservation Service land in northwest Louisiana as an aerial bombing target.
5. Transfer of 65,000 acres in the Holly Springs division of the DeSoto National Forest, Miss., for location of Camp Shelby, cantonment and training area.
6. Use permit on 18,000 acres of land in the Gasconade division of the Mark Twain National Forest, Mo., for location of Camp Leonard cantonment and training area.
7. Transfer of 7,304 acres of the Pine Camp, N. Y., Soil Conservation Service project, to the War Department. Use not designated.
8. Transfer of 5,869 acres in the Plattsburg, N. Y., Soil Conservation Service project to the War Department for a rifle range.
9. Transfer of 1,000 acres in the Cookson Hills project, Okla., to the War Department. Use not designated.
10. Use permit on one-half acre in the Caribbean National Forest, Puerto Rico, to the War Department for observation lookout.
11. Use permit on 150,132 acres in the Enoree division, Sumter National Forest, S. C., to the War Department for use in Army Corps maneuvers.
12. Transfer of 9,482 acres of Soil Conservation Service land in Wisconsin for location of Camp McCoy.
13. Transfer of 173.52 acres of the Farm Security Administration's Jacksonville Homesteads to the Navy Department for low-cost-housing development for naval air station, Jacksonville, Fla.

In addition to the lands transferred from the Department for defense activities, the land appraisers and land-acquisition personnel of the Department have assisted the War and Navy Departments in acquiring large acreages of privately owned lands located in many States to be used as sites for defense plants and cantonments and for other military and naval purposes.

## Impacts on Rural Communities

The impact on a rural community of the development of a defense industry or military establishment is far reaching. It may be accompanied by serious maladjustments in the economic and social economy of the local area. Advance planning and provision for

meeting the resultant problems with leadership and financial assistance are essential. In the press of the emergency, however, this has not been possible in many instances. Affecting local communities are such problems as the necessity for evacuating families from defense sites; the supply of suitable farms upon which they can relocate; the costs of providing for displaced poor families; difficulties incident to the removal of portions of the tax base of school districts, townships, and other local units with high bonded indebtedness; congestion and overburdening of public facilities, such as roads, schools, waterworks, sewage-disposal plants, and recreational centers; housing shortages for defense workers; and in some areas farm-labor shortages.

In cooperation with State agricultural colleges and with State and county land-use-planning committees, field representatives of the Department have established information centers in defense-project areas to provide farm families with accurate and timely information and advice as to plans for the acquisition and evacuation of the area. Facts about the types and amounts of assistance required by dislocated families have been assembled, along with information as to farms available for rent or sale and the location of temporary housing and storage facilities for livestock and feed. These information centers have helped hundreds of families and individuals in disposing of surplus chattels and in getting relocated and reestablished.

Many families have received financial help through the credit agencies of the Department. Rehabilitation loans and emergency loans have been made to those who were able to locate suitable farms and who needed additional funds for livestock, equipment, and production purposes. Grants, with repayment not required, have been made for the subsistence needs and the moving expenses of families in distress, particularly those with little or no equity in the evacuated land. In several States, defense relocation corporations have been established for the purpose of assisting displaced families to obtain sufficient agricultural land to develop family-sized farms.

Local surveys have been made to determine how many rural men and women in defense areas want employment in construction work or in the operation of certain of the plants. This information has been made available to the employing agencies. Farm-labor committees have been set up in most States to cooperate with the United States Employment Service in disseminating information to rural people as to the demand for farm and industrial labor.

The Defense Housing Coordinator requested surveys in several defense areas to determine opportunities for providing on farms housing for defense workers. Houses so located afford the defense worker an opportunity to maintain his family in the open country. They relieve congestion in the defense areas and can be sold to farmers after the defense emergency is over. The surveys indicated considerable opportunity for action of this kind. They also revealed a desire on the part of many farmers to cooperate in such an undertaking. As mentioned elsewhere in this report, the Farm Security Administration is constructing attractive modern homes for defense workers in several areas on farm ground leased under the agreement that when the emergency is over the farmers may buy the houses

at prices representing their value then. This may range from 50 percent to 80 percent of their original value, according to the duration of their use for defense purposes.

Through these and other cooperative-planning approaches much has been accomplished in the extension of defense industry into rural areas. Money earned from labor in the defense plants will enable many rural people to improve their homes and small farms. It will assist them to purchase the manufactured goods they need, to meet obligations incurred in earlier periods, to pay taxes for the improvement of local services and facilities, and to share more adequately in the increasing national income. Important also is the opportunity provided many rural people to learn industrial skills. The training they receive may make possible the further development of local industries when the war emergency is over.

## THE NUTRITION CAMPAIGN

Meeting the food problems of 1941 is more complicated than was the job of producing food to win World War I. Then, as now, the Department of Agriculture was called upon to stimulate production. But then the emphasis was largely on expanding acreages and facilities to meet the increased need in this country and abroad for wheat and certain other staple crops. Today the problem is one of providing enough of the right kinds of food and of shifting the acreages and uses of grains and feed crops to increase the abundance of foods rich in protective vitamins and minerals.

In formulating the food policy needed for the present emergency and in putting it into action, the Department of Agriculture had three important considerations which were absent during World War I. (1) Tremendous strides have been made since 1918 in working out a scientific basis for human nutrition. (2) We have large stocks of some foods. (3) Agriculture today is organized to make Nation-wide adjustments in the acreage and production of basic commodities. Food scarcity, rationing, and substitution are unlikely and certainly unnecessary if we utilize effectively our scientific knowledge and our facilities for production.

In our industrial life, our military life, and our agricultural life we must consider the nutritional status of the Nation as a whole. The strength of the whole people is the composite strength of its individuals. To have the whole people united requires physical health and morale for every man, woman, and child.

There must be no hunger, obvious or hidden, if the American people are to have the mettle required to make democracy live. Bad food habits, ignorance of proper food preparation, and missing links in our methods of food processing have been responsible to a large extent for unsatisfactory diets in the United States up to now. Compared with other nations the American people on the whole are not ill-fed, though malnutrition is far too common among the low-income groups. Nevertheless, our agricultural resources and production techniques provide the possibility of a much higher level of nutrition.

The Department of Agriculture has been stimulating greater production and use of foods that build strength, stamina, and steady

nerves. Nutritionists call these the protective foods. They are rich in the vitamins and minerals required in the diet of everyone. The program requires education, planning, coordination of many services, cooperation with other governmental agencies, and encouragement to food industries to adapt production to nutritional needs under modern nutritional standards.

When the defense emergency arose, two types of nutrition problems required action. One type resulted from the sudden expansion of defense industries. Many towns could not care for the rapid influx of defense workers. There were shortages of houses, of facilities for distributing foods and other essentials, and of public eating places. These shortages raised the cost of living, and the workers' health suffered.

Action to relieve this problem required cooperation among numerous Government agencies throughout the country.

### The Problem Broadly

The second and much more general type of problem concerned the nutritional level of the country. Among other things, it called for a general education program, which was launched on both a national and local scale through clubs and schools. It emphasized the need for a well-balanced diet and for simple standards to guide the selection of such a diet. It endeavored to popularize the scientific knowledge about nutrition that has become available during the past 10, 20, or 30 years.

Since nutritional defense extends beyond the sphere of any one department, it is necessary to understand the Government's organization for it. This Department's place in the work is close to the center. When the Advisory Commission to the Council of Defense was appointed, provision was made for a division of health, welfare, and consumer activities, with a separate nutrition section. Under this authority, various important committees were appointed.

Two of these were subcommittees of the National Research Council, chartered by Congress at the time of the World War I to serve as an advisory agency of science to the Government in time of need. One of the subcommittees appointed was that on nutrition. It cooperated with the milling and baking trade and with the Food and Drug Administration in working out the "enriched" flour and bread formula, which was adopted generally by the milling and baking trade early in 1941 and on January 1, 1942, will go into effect as part of the official food and drug standards. The formula is already in general use. Increasing amounts of white bread available commercially bear the enriched-flour label. Another contribution made by this subcommittee is the new dietary guide for persons of all ages, announced on May 27.

The second subcommittee of the National Research Council is its Subcommittee on Food Habits, which is gathering facts on food habits as they relate to the nutrition of people. Poor food habits passed on from one generation to another are one of the biggest handicaps to a sound nutrition program. Some food habits, on the other hand, are worth preserving and popularizing. In certain areas of the South, for instance, one medical authority has found poorer nutrition among white people than among Negroes of the same low-income level.

## Nutrition Committee Appointed

A nutrition committee was appointed to advise with the consumer member of the Council of National Defense. Its chairman was the Director of Extension Work in this Department. The Committee served in advisory capacity to the Health and Welfare Division of the Advisory Commission to the Council of National Defense until November 28, 1940, when an Executive order placed all activities dealing with health, medicine, welfare, nutrition, recreation, and related subjects under the Federal Security Administrator. The Nutrition Advisory Committee, with the addition of representatives of all agencies in the Government planning programs and also home economists, dieticians, nutritional scientists, food technologists, and public-health officials, now serves in an advisory capacity to the Coordinator of Health, Welfare, and Related Defense Activities.

By Executive order of the President on September 3, 1941, there was created within the Office of Emergency Management the Office of Defense Health and Welfare Services. The Federal Security Administrator, who was Coordinator of Health, Welfare, Nutrition, Recreation, and Related Defense Activities, became the Director of the new unit. The Director of Extension Work in the Department of Agriculture became the Assistant Director of Defense Health and Welfare Services in Charge of Nutrition. He assumed these duties in addition to his duties as Director of Extension Work.

Most States have organized State nutrition committees composed of representatives of various agencies concerned with problems of food. These committees consist usually of representatives of research and teaching in nutrition and home economics at the land-grant colleges and of the divisions of home economics of the State departments of education; of the State agricultural extension services; of the Work Projects Administration; of the National Youth Administration; and of child-welfare agencies. The State representative of the American Red Cross is usually a member. Such groups as the parent-teachers associations, the State medical and dental associations, and State home economics and dietetics associations have representation on the State committees.

Action taken by this Department for nutritional defense in the past year has sought especially to get the new knowledge of nutrition more firmly established in the public mind. Educational programs have aimed at a wider application of nutritional knowledge in many fields from the production to the distribution, choice, and consumption of foods. Work has been started to get food to the people who need it.

The Department has helped to lay the ground work for State, local, and national nutritional planning. The Federal Extension Service, with the State extension services and with 600,000 volunteer workers, provides a channel through which information on nutrition can be carried into every rural county and community in the United States.

## Live-at-Home Movement

Through this organization the Department has encouraged farm people to produce on the farm more of the protective foods rich in vitamins and minerals for home use. Educational emphasis on

farm family food supplies is almost as old as the Extension Service itself; yet it takes on new significance in the light of recently discovered dietary facts. Working closely with the State colleges of agriculture, which have trained thousands of farm boys and girls in agriculture, agricultural economics, nutrition, home economics, and farm living, the Department is bringing nutritional science to bear effectively on both food production and food consumption. The Farm Security Administration in its work with low-income families has done much to raise their nutrition level. The Surplus Marketing Administration does important nutrition work through the food-stamp plan, the school-lunch program, the low-cost-milk plan, and surplus distribution through relief agencies.

Facts presented at the National Conference on Nutrition for Defense held at Washington, D. C., in May 1941 left no doubt that this country has the resources and the capacity to produce sufficient food so that all its people can enjoy a nutritionally satisfactory diet. The United States has: (1) A national income, which, if fairly distributed, could provide everyone with at least a minimum diet for good health; (2) means available for increasing the national income; (3) much scientfic knowledge about food values and human nutritional needs; (4) ability to apply this knowledge to the production, processing, preservation, and preparation of food; (5) an unsurpassed, if not yet entirely efficient system of distribution and transportation; (6) press and radio facilities, periodicals, libraries, schools, and health centers, and State and local organizations, through which nutrition knowledge can be brought to almost every home; and (7) thousands of people in public and private life who have been trained in at least the rudiments of nutrition.

### Recommendations of Conference

Recommendations adopted by the Conference included:

(1) Use of the dietary standards prepared by the Committee on Food and Nutrition as a goal for good nutrition and as a yardstick for measuring progress.

(2) Translation of these standards into terms of everyday foods and meals suitable for families and individuals in the various income levels.

(3) Vigorous and continuous research to add to the present knowledge of nutrition in all ways possible.

(4) Increased nutritional education among doctors, dentists, social-service workers, and teachers.

(5) Greater use of educational means and facilities to reach laymen through schools, motion pictures, the radio, the public press, home and community demonstrations, and similar means.

(6) Mobilization of local, State, and national organizations, groups, and services that can contribute in any way to raising the nutritional level of the people.

(7) A continuous effort to solve the fundamental problems of unemployment, low income, and economic insecurity among all levels of the population.

(8) The improvement and full use of such devices as the food-stamp plan, free school lunches, low-cost milk distribution, and distribution of food surpluses at a fair return to the farmer.

(9) Improvement of food distribution, including processing, marketing, packaging, and labeling, to bring about greater real economies for the consumer.

(10) Encouragement of greater production of protective foods.

(11) Encouragement of more production for home use by rural people, especially those at low-income levels.

(12) Restoration, or supplementation, in the quantity provided in the raw food before processing, of the vitamins and nutritive elements that have been removed by modern processing.

The Department of Agriculture is directing its policies and activities toward achieving these ends. Its educational and administrative agencies alike are stressing the new knowledge of nutrition and encouraging farmers to grow more of the foods required for better nutrition. It is combining nutritional planning with land use planning and cooperating closely with the office of the Coordinator of Health, Welfare, and Related Defense Activities. The policy looks beyond the immediate emergency. It considers nutrition in terms of our entire farming and industrial economy for post-war readjustment as well as for wartime needs.

## THE PROGRESS OF NUTRITION KNOWLEDGE

Almost 50 years have passed since Congress made its first appropriation to the Department of Agriculture for the study of human nutrition. During this period scientists within and without the Department have learned much about the nutritional needs of man and what various foods contribute to diet. We now know that food must furnish more than protein, fat, carbonhydrate, and ash, or minerals. The list of dietary essentials has lengthened until it now includes some 40 chemical substances. These include a great variety of amino acids, minerals, and vitamins, and energy-yielding substances.

Nutrition scientists recently summarized our knowledge of food requirements in the form of specifications for a satisfactory diet—a new yardstick for good nutrition. This yardstick, announced at the National Conference on Nutrition for Defense, lists the needs of persons in 15 different age-sex-activity groups in terms of calories, protein, 2 minerals, and 6 vitamins. Nutritionists are already at work translating these diet specifications from grams and International Units into market lists that any homemaker can turn into satisfactory meals. The Bureau of Home Economics has prepared four sets of master diet plans at three cost levels. These are in terms of groups of food general enough to be followed in any part of the country at any season.

There is great need for such diet plans. Studies of the Bureau of Home Economics indicate that scarcely one family in four in the United States now has a diet that measures up to the new nutrition yardstick. Indeed, more than a third of the National's families have diets that are seriously low with respect to one or more of the food values needed for health and well-being.

Although malnutrition is seldom a primary cause of death in this country, it is, nevertheless, responsible for an appalling amount of disability. Only part of this disability shows up in obvious de-

ficiency diseases such as pellagra, beriberi, scurvy, or rickets. Poor diet also leads to retarded growth and development, unsteady nerves, fatigue, and lack of initiative and working power. A high proportion of the population bears the marks of inferior diet, as the many studies clearly show. Some of these marks come to light in blood analyses for vitamin C, in X-ray studies of skeletal development, and in various functional tests, such as a person's ability to adapt his vision quickly to changes from bright to dim light.

Consider the effects of the hot school lunch on underprivileged children. Even the addition of milk, fruits, or vitamin concentrates has bettered the physical condition of many groups. The benefits show in more normal rates of growth, improved blood, lessened tooth decay, lessened illness, and greater alertness and general well-being. Sometimes the children have needed a greater quantity of all kinds of food; sometimes they have needed specific nutrients. There is improvement so frequently from the supplementary feeding of children, and from so many different types of diet supplement, that nutrition specialists conclude that nutritional inadequacies are multiple rather than single. It does not necessarily follow, when improvement attends some special type of addition to the diet, that everything possible has been accomplished. Perhaps further good might result from further and other supplementation of the diet.

## Distribution of Nutrients in Foods

The nutrients that human beings need are very unevenly distributed in common food materials. Some are so widely distributed that they are likely to be adequately furnished in the most haphazard food selection. Others occur in significant quantities in only a few foods. Hence, great care is necessary to make sure that we get enough of the latter.

Many families in this country get too little of the B vitamins (especially thiamin, nicotinic acid, and riboflavin), of calcium, of vitamin A, of ascorbic acid. In terms of common food materials this means that many diets should include more milk and other dairy products, more green, leafy, and yellow vegetables, more vitamin-C-rich foods, such as raw cabbage, tomatoes, or citrus fruit, and more of the grain products in less highly refined forms. In some sections of the country, there is a dietary lack also in lean meats, fish, poultry, and eggs.

First we must produce the kinds and quantities of food needed to provide everyone an adequate diet. Next, we must improve the distribution of these supplies and increase the average use of certain protective foods. If everyone now having less could have at least as much as is called for by a low-cost diet patterned after the new yardstick for good nutrition, this country would consume 50 percent more milk, an eighth more eggs, a third more tomatoes, citrus fruits, and other vitamin-C-rich products, and 80 percent more leafy, green, and yellow vegetables. These goals call for adjustments upward of farm production in certain lines.

It is important to conserve the nutritive values of food in the processes of canning, drying, curing, and quick freezing, and also in food storage and in cooking. Studies are being made of the vitamin

losses that attend various procedures in processing, storage, and cooking. They will probably develop means of reducing the loss and waste of vitamins.

Recently the flour-milling and baking industries placed on the market white flours and breads to which had been restored some of the vital B vitamins, which disappear in the manufacture of patent flour. This action, which nutritionists warmly approved, will help to overcome dietary shortages of the B vitamins, especially among the low-income groups, who normally use large quantities of wheat flour and bread. The specifications for "enriched" products call for more iron and more thiamin, nicotinic acid, and riboflavin than is found in patent flour.

These nutrients are now being added to flour and bread in several ways. They may be put in directly as pure chemical substances; still better they may be added by restoring to patent flour certain "mill-streams" of the refining process. In baking bread they may be put in by adding high-vitamin-B yeast and other suitable natural food products. Enrichment of flour and bread through the addition to them of natural food products is advantageous because the latter carry not only the nutrients specified above, but others that may prove to be equally important.

In general, it is good policy to get the nutrients we need from natural foods. In time of emergency, however, it may be wise to restore or fortify some basic foods with added minerals and vitamins. This may help to safeguard the nutrition of many people who might otherwise not get enough of some of the essentials of a good diet. However, we cannot generalize as to the desirability of enriching any specific product. The question requires careful consideration of its many aspects, product by product.

## Economic Obstacles To Better Diets

Another problem is that of overcoming economic obstacles to good diets. On December 22, 1940, according to a poll of public opinion, approximately 4 families in every 10 thought they were going without foods that make for better health because they had too little money to spend for food. The largest number of these were families earning less than $20 a week. Many studies have shown, as one might expect, that higher incomes lead to better diets.

In city food habits the country over, the use of fresh fruit increases considerably with every successive step-up in income. This means that as incomes rise there is a greater increase in vitamin C than in other dietary essentials. In a study recently reported of children of lower and higher income groups in New York City, the vitamin C content of the blood plasma was below normal (0.6 milligram-percent) among 43 percent of the boys and 31 percent of the girls in the lower income group. Values equally low were found among only 6 percent of the boys and 1 percent of the girls in the higher income group.

The riboflavin content of the diet—supplied chiefly by milk, lean meats, and green leafy vegetables—is frequently below the level suggested by the National Research Council's new yardstick, but more frequently among the low- than among the high-income families.

These differences are born out by one of the tests used in the New York study mentioned above, which showed old or current deficiencies in riboflavin in 2 percent of the children in the higher income group but in 75 percent of those in the lower.

How much families can afford to spend for food for each person depends not only on income but also on the number of mouths to be fed. With a monthly income of $100, for example, a husband and wife might spend $6 a week for food. If the couple had two children of school age, they might spend $7. And for a family of five or six—including one or two children in high school and twins of grammar-school age, the food bill might be $8.

Such spending means an average of about 16.5 cents per adult-unit per meal for the couple without children, but only 9.5 cents per adult-unit per meal for the family of 5 or 6. Of every 100 two-person families included in the consumer purchases study in villages and cities of the North and the West regions, 30 were found to have diets that could be called good, 45 had diets that were fair, and the diets of 25 had to be graded poor. On the other hand, of the large families studied in the same part of the country and with the same income, only 5 out of 100 had a good diet, 50 had fair diets, and 45 had poor. Given the same income, the larger the families, the larger the proportion with poor diets.

How many families fall in each grade-of-diet category of course depends on the standards used. In these studies the Bureau classed a diet as "poor" if it failed to meet the following specifications—per (adult) nutrition unit per day—with respect to one or more nutrients: Protein, 50 grams; calcium, 0.45 gram; phosphorus, 0.88 gram; iron, 10 milligrams; vitamin A, 3,000 International Units, thiamin (vitamin $B_1$) 1 milligram, ascorbic acid (vitamin C), 30 milligrams; and riboflavin, 0.9 milligram. The Bureau classed a diet as "fair" if it met or exceeded these specifications for each nutrient, but by a margin of less than 50 percent with respect to one or more nutrients. A diet was called "good" if it provided a margin of at least 50 percent beyond the specifications listed for each nutrient.

Most nutritionists will agree that any diet classed as poor by the specifications given could be improved to the advantage of human well-being. In fact, the specifications even for a good diet are modest, especially with respect to the vitamins. In terms of actual foods, the difference between diets graded good and those graded poor lies in the quantities of milk, eggs, green leafy vegetables, and vitamin-C-rich fruits. Spending only 9.5 cents per person per meal, every member of a large family is likely to have less of these protective foods than is desirable. Certainly the chances of being skimped are greater in the large than in the small family when incomes are equal. Were the large families able to spend the same average amount per meal per expenditure unit as the small family, then there would be little difference in the proportions having diets of each grade.

If a way could be found for families at the lower economic levels to have more money to spend for food, the level of nutrition for the whole United States would be greatly improved. The increase in national income between 1935–36 and 1940 and the decrease in the proportion of families in the lower income brackets may have

enabled some 2 million families to rise from poor to fair or good diet levels. But it takes a big increase in income to improve diet levels noticeably. As income rises clothing, automobiles, and other needs and wants compete immediately with food for a larger share of the family budget.

## Relation of Income to Nutrition

Malnutrition is no respecter of pocketbooks; it occurs even among families in the higher income brackets. But when families need not count pennies for food too carefully they are likely to include liberal quantities of protective foods in their diets, even without much conscious planning for nutritional needs. The figures below show how purchases of these foods step up when families in small cities have more to spend for food. The diets of three groups of families are compared: One group spent an average of $1.75 per adult-unit per week for all foods; another spent $3.15; the third spent $4.55.

| | *Average quantities consumed per adult-unit in families spending each week for the food of each person—* | | |
|---|---|---|---|
| Selected food items: | *$1.75* | *$3.14* | *$4.55* |
| Milk (or its equivalent)—pints | 4 | 7 | 9 |
| Eggs—number | 3 | 5 | 8 |
| Meats, poultry, fish—pounds | 1½ | 2½ | 3½ |
| Tomatoes, citrus fruits—do | 1 | 1½ | 3 |
| Leafy, green, and yellow vegetables—do | 1 | 1½ | 2 |

Naturally the lower the economic level, the greater the likelihood of malnutrition. Thousands of families in the lower income groups do not have the money to buy the essentials of a good diet. Nor do they have much chance to learn about the relation of food to health and how to get the greatest returns in nutrition for their food dollars. Their market information is limited too; they often cannot take advantage of what is abundant and cheap.

The development of inexpensive forms of essential basic foods (such as dry skim milk) that could be packaged and distributed cheaply is a great need of low-income families. Processing and distribution costs bulk large in the Nation's food bill. In 1940 American consumers spent about 14.8 billion dollars for foods grown in this country. Of this amount the farmer got about 6.2 billion dollars. The remaining amount, or 8.6 billion dollars, went to pay the various charges for transportation, processing, and marketing.

Many of the latter group of services are as real and as important as those rendered by the farmer, but costs of providing them in many cases could be greatly reduced by increased efficiency in the distributive system. Food prices are sometimes higher than they otherwise would be because of bottlenecks, both public and private, or because of monopoly, racketeering, or other illegal practices. Such practices call for vigorous action under the Antitrust Act.

## Role of Public Agencies in Nutrition

Some forms of municipal, State, and Federal legislation hamper the ability to produce, process, and distribute foods at prices within the reach of low-income families. Such legislation includes restric-

tions not designed solely for the protection or the help of consumers or the public welfare; certain forms of price-fixing or price-maintenance legislation; internal trade barriers; taxes on foods and on particular methods of distribution. All such laws should be carefully and judiciously reexamined to determine their effect on everyone concerned.

Subsidies direct to low-income consumers can play a significant role in increasing their consumption of food. The Surplus Marketing Administration is authorized to get extra food to underfed families who have too little money to pay the market price for adequate food supplies. This type of work is now done under three programs: (1) The direct purchase and shipment of surplus food for distribution through welfare agencies to families and to schools for free lunches for needy children; (2) the food-stamp plan; and (3) the relief milk program.

Although the surplus-removal programs deal with only a small part of the total volume of food consumed in the country as a whole, they make a marked contribution to the diets of the recipients of the surplus products.

For example, in Washington, D. C., milk is available at 5 cents a quart to certain groups of families certified as needy. The consumption of fluid milk by a group of eligible families before the inauguration of the plan was 1.5 quarts a person a week among white families, and 0.9 among Negro. After the 5-cent milk became available, the figures for participating families were 3.2 quarts a person a week among white and 2.8 quarts among Negro families. This increase in consumption, made possible by the low price, helps to correct deficiencies in calcium and riboflavin which are common in the diets of low-income families.

In 1940 the quantity of all foods distributed by the Surplus Marketing Administration through direct distribution and the food-stamp plan was enough to provide somewhat more than one-third of the caloric needs of the low-income families it reached. It was enough to supply a substantial proportion, although less than one-third, of the protein foods, minerals, and vitamins these families needed. Month by month in 1940, about 1 person in every 12 in this country received some part of the surplus food supply through the SMA's direct-purchase and distribution program or through the stamp plan. In early 1941 the same programs were getting food to one out of every 11 persons in the country. The total nutritive value of the entire diet of families aided by any of these surplus removal programs depends, of course, on how well their usual food purchases supplement what they get through surplus-distribution plans.

## Choice and Cooking of Food

We could raise our level of national health—no one can predict by how much—merely by wiser choice and better cooking of food. This is true in farm homes and in city homes and for families that are rich, poor, and in "average" circumstances. Many people count calories; they are curious about vitamins. But they have no full realization yet of what the right food can do for them. Just as the bad effects of long-continued poor diets carry over to handicap succeeding

generations, so are the good effects of good diets passed along from parent to child.

Every careful dietary study shows the need for more widespread educational work in nutrition. For example, the 1936 studies of the Bureau of Home Economics indicated that in every income class some families obtained better diets than others. This was true, moreover, at every level of food expenditure. Families living in villages and cities of the North and West showed the following variations:

| Average expenditure for food per person per week: | *Percentage of families with diets graded—* | | |
|---|---|---|---|
| | *Good* | *Fair* | *Poor* |
| $1.75 | 0 | 27 | 73 |
| $3.15 | 24 | 64 | 12 |
| $4.55 | 69 | 28 | 3 |

Choice of foods rather than economic status is the chief determining factor in the diets of families that have $2 or more a week for the food of each person. The homemaker who is a good manager and keeps up to date on food values and nutrition is the one to be credited most when families are well fed. She knows how to buy food economically, cook it well, and serve it attractively. Without her skill in market and kitchen, a family may be aware of the importance of good nutrition and yet be unable to achieve it. To help homemakers with this many-sided problem many bulletins and other material have been prepared by the research and extension agencies of the Department and the land-grant colleges.

In some ways the diet problems that farm families face are more complicated than those of city families. Farm families must have the same skills in overcounter buying and in meal planning and cooking. In addition, they must have the managerial ability to plan ahead for one or more years, so the home-produced share of their food supply will properly complement what they buy. This requires planning of both from the standpoint of nutrition and farm and home management. Help in such planning is one of the chief functions of the Extension Service and the Farm Security Administration.

Workers in these agencies help to translate nutritional requirements into terms of quantities of foods needed by families of given size. This furnishes the basis for the home-production and purchasing plan. Success in the task, however, demands the aid of many other agencies both in research and in action programs. Nutritionists, specialists in food-production problems, and advisers in home and farm management, cooperate with State, county, and community committees in general program planning. The AAA programs afford many opportunities for bettering home food production. Land use planning committees in the counties work for the better nutrition of farm families.

Studies of farm diets show there is urgent need for this kind of planning. Actual cash outlays for food per person within a given farm income group may be only a little greater among farm families with diets graded excellent than among those with diets graded poor. On the other hand, farm families with good or excellent diets generally have much more home-produced food per person than those with fair or poor diets. The difference generally comes in more milk for the family table, more poultry, meat, and garden products.

For the individual or family in town or country whose resources are equal to the task, better nutrition may be brought about simply by a change in the proportion of the different food eaten. It may require learning to like new foods or food prepared by new methods that conserve more of the nutritive values. It may call for better buying or for a program to produce more of the family's food on the home place. It may mean devoting a larger share of the budget to food. Families whose resources are not sufficient to provide for good nutrition may need the help of Federal, State, or community action. There are shortages in food knowledge and in buying power that must be attacked on a broad front by many agencies.

### Nutrition of Army and Navy

For the use of Army and Navy officials, the Bureau of Home Economics has computed the nutritive value of various types of rations and has worked out formulas for emergency food rations high in nutritive content. It is testing various foods to assist the Surplus Marketing Administration in its purchases for distribution to needy families, for school lunches, and for shipment abroad under the lend-lease program. It has advised the Red Cross and other agencies as to what foods they might well purchase for shipment abroad and as to the selection and purchase of equipment for shipment abroad for the use of refugees. At the request of the Office of Price Administration it is summarizing data on the materials used in the manufacture of cooking utensils and other household goods, with a view to conserving aluminum and other metals for defense purposes. It is cooperating with other agencies in preparing cost-of-living data for rural communities for use by defense agencies in planning the decentralization of defense production.

There is a broad application of the Bureau's research to the food-for-defense program, which calls for a greater output of certain products for use within the United States as well as for export under the lend-lease program. Facts about food values are necessary to the program. For defense agencies the Bureau is compiling data on the quantities of various foods customarily consumed by different economic groups, as compared with (1) the quantities required for health, with (2) the quantities required in the most economical combinations, and with (3) the quantities available from expenditures no greater than the usual outlays for food. In defense-production planning such data are essential.

In addition the Bureau of Home Economics is summarizing the vitamin content of foods for the use of defense agencies and nutrition committees. This job entails a review of the entire world literature on vitamins. Studies are under way to determine the effect of processing and cooking on the vitamin content of foods. They may show how far it is safe to depend on processed foods as a source of vitamins. What happens in home baking to the vitamins in "enriched" flour is part of the inquiry. Another study with a defense application is vitamin analysis to guide consumers in the use of natural foods. The Bureau is also assembling data to determine adult requirements for vitamins, particularly for vitamins A and B. It is highly important, for example, to know the amount

of vitamin A required to safeguard aviators, motorists, and others in hazardous pursuits from nutritional night blindedness.

## THE WARTIME JOB OF THE AAA

The Agricultural Adjustment Administration's job in wartime is bigger than it was before. It is not, however, a different job. It is the old job, with simply a change of emphasis among the priorities and an increase in the size of the undertaking. As the Government agency that aids the farmers in cooperative crop adjustments, the AAA is trying to do now what it has tried to do all along; namely, to assist the farmers in producing more of what the country needs and less of what it does not need. Moreover, the commodity emphasis is not basically different from what it was before the war began. We still need more dairy and meat products in particular and less wheat, cotton, tobacco, and other surplus crops. Change of priority among AAA objectives results from the fact that the war situation almost automatically raises the farm income and at the same time creates urgent new needs for particular crops. The AAA's task is bigger because, in a changed crop balance, we need a record total farm production.

Many people believe mistakenly that the AAA has turned its back on its past and suddenly inscribed abundance rather than scarcity on its banner. Nothing could be further from the truth. There is no change in its basic objective. It was abundance in the beginning, and it is abundance now. Originally, to be sure, the AAA had to approach the goal of real abundance indirectly, through programs to curtail the production of farm surpluses. This was not a program of scarcity. It was a clearing of the decks, an elimination of things not wanted, as preparation for the production of things wanted. There was never any throttling down of agriculture as a whole but simply a necessary redirection of its energies. The result was more abundance for everyone.

The proof is common knowledge and appears concretely in enhanced farm and city incomes. Consumers in the United States have never gone short as a result of AAA programs. On the contrary, through the stimulus that farm recovery has given to city employment, consumers have been enabled to raise their standard of living. Complaints against farm prices have arisen at times, but they have been traceable to droughts and other uncontrollable causes rather than to any failure of the national farm program to provide adequately for consumer needs. The farm program has been adopted to meet these changing conditions. Now that war has come, the National Defense Program raises the income of both urban and rural people. It becomes the duty of the AAA to encourage a sufficient corresponding increase of certain farm products, so that increased consumer incomes will have goods to match and so that we can provide food in addition for Great Britain and other embattled countries. The AAA procedure to meet these requirements is a development of that which it used to promote pre-war farm and urban well-being.

For example, the wartime situation enhances both the need to restrict the production of our usual export crops and the need to en-

courage the production of meats, dairy products, poultry and eggs, and certain fruits and vegetables. It calls, in other words, simply for a continuance, with a heavy increase in some lines, of the production pattern we found desirable before the war broke out. There is an unchanged need for conservation; no one wants another reckless plow-up of the plains. There is an enhanced need for a national nutrition program not only for the sake of defense and healthy manpower but as a protection against having surpluses of a new kind on hand when the war stops. As already mentioned, that is a risk we must take in order to have total preparedness. It is one of our defense obligations; but we can minimize the risk by various means, and the nutrition program, along with AAA crop controls, is one of the most important of these.

## The Wartime Challenge

Mainly, the war is a new challenge to AAA activity rather than a call to alter its objectives. In 1934 and again in 1936, for example, tremendous droughts obliged it to foster increased production in lines in which the droughts had cut production down too much. Simultaneously the problem of conservation demanded action. There was need too for the protection of producers and consumers against harmful price fluctuations. The means adopted was the upbuilding of the Ever-Normal Granary, with its storage, commodity-loan, and crop-adjustment features. If the Ever-Normal Granary of corn had not been started in 1938 we would not have the feed to convert into the meat and other products which the defense program requires.

The war did not find the AAA machinery wanting; it had been designed for flexible response to various situations. Yet the shift to high gear was not entirely simple. For one thing it was the first time in the AAA's experience that needs had justified all-out production in many lines simultaneously; moreover, the AAA system is not a machine but a Nation-wide organization of farm operators, each of whom has an individual duty to perform. The shift from low to high gear could not be accomplished with the single movement of a lever. It required the informed, cooperative, and coordinated action of millions of people, and multiplied many times the duties of AAA personnel.

Essentially, in wartime as in peacetime, the function of the AAA is to assist farmers in making crop adjustments collectively that they could not make individually. It is especially a means of guiding their response to abnormal market situations. In many respects our farm problem in this war is different from what it was in the last war, but in at least one vital respect it is similar. Farmers have to adjust themselves to the food demands of governments—our own and those of certain foreign nations. Without guidance through such an agency as the AAA, they would incur a heavy risk of making the adjustment badly and dangerously—as the story of World War I sufficiently attests. Every wartime market is a thoroughly abnormal one. Its fate depends on the progress and outcome of the hostilities, and a purely individual, uncoordinated farm response to it is nowadays quite impossible. Guiding the response is a necessary public task, as much for the sake of the farmers themselves as for the sake

of the Nation. Guiding the post-war readjustment to peace conditions is likewise a necessary public task. The AAA system, with its widely developed farmer participation, is a means of getting these jobs done in a manner at once efficient and democratic.

## AAA Facilities for Food Campaign

Besides the machinery developed during 8 years of crop-adjustment experience, the AAA has a whole new system of price incentives made available by Congress. In the basic crops, for example, there is a higher level of loan rates, coupled with higher penalties for excess marketing. There is power here to encourage a switch from overproduced to underproduced lines. In nonbasic crops Congress authorizes purchasing for lend-lease export, price supports, offers of aid to farmers against sudden price changes in the post-defense period, and other incentives to increased production. The existence of a well-defined Ever-Normal Granary enables the AAA to assist farmers in getting feedstuffs for livestock, dairy, and poultry production. Shaping its programs to fit the needs of the emergency, the AAA works with farmers through the USDA defense boards, the farmer committee system, and Federal and State field workers. Along with its established objectives, the AAA program takes on a new and broader national meaning in which the prevention of surpluses, the conservation of resources, the maintenance of the Ever-Normal Granary, and the support of farm prices and farm incomes become parts of the greater purpose of national defense.

More than 135,000 farmer committeemen help to administer the Agricultural Adjustment Administration program locally. They are elected by farmers in every rural county in the United States. These committeemen personally get in touch with individual farmers, tell them what the Government would like to have them produce, explain the price and other conditions that have been established to facilitate the job, and show them the manner in which revised conditions of participation in the program of the AAA give them incentives to cooperate. They provide the farm-to-farm canvass that is necessary, in accordance with plans worked out by State and county defense boards of the Department of Agriculture. The response in terms of eager preparation for a farm output especially designed to meet the needs of the emergency is more than satisfactory in all parts of the country.

Besides encouraging farmers to convert feed supplies into meats, dairy products, and poultry, the AAA in 1941 especially promoted expansion in the acreage of certain feed crops and vegetables. In areas hit by drought, it encouraged the planting of emergency forage crops such as sorghums and soybeans. In determining acreage allotments tomatoes, corn, peas, and snap beans for canning were not classified as soil-depleting crops. This policy enabled growers to expand their acreages of such vegetables without incurring any deduction from their conservation payments. Special provisions in the AAA program stimulated the production of more soybeans and peanuts for oil. In the commercial corn-producing areas, farmers could produce up to their usual corn acreages without incurring any deductions from AAA payments other than corn payments. Withdrawals of corn and other grains from the Ever-Normal Granary

and the sale of Government-owned corn encouraged the feeding of livestock and poultry. Substantial movements of Ever-Normal Granary corn to the Northeast States improved the feed situation there.

Participants in the AAA programs cashed in, from a defense-production standpoint, on conservation work they had done in previous years. They had better soil, better balanced cropping systems, ample feed reserves either on their own farms or under loan in the Ever-Normal Granary, and much useful experience in converting stored fertility into foods. In the last 8 years they have taken about 30 million acres out of soil-depleting crops and converted them to pasture and other conservation uses. Thus employed, these acres are also useful in defense production. They facilitate the kind of production that the situation requires. The 1940 census shows that in the last 10 years there has been an increase of nearly 22 million acres of plowable pasture and of more than 15½ million acres of fallow and rested land. This addition to the arable reserve is now supplying food for defense, for the improvement of the Nation's nutrition, and for lend-lease export.

## Six Million AAA Participants

Altogether about 6 million farm operators participated in the 1940 agricultural conservation program, which included almost 365 million acres, or 80 percent of the Nation's cropland. Reports on participation in 1941 will probably show even fuller cooperation. The emphasis in 1940 was heavily on conservation. This year the emphasis is heavily on production for defense. Nevertheless there is no conflict between the two objectives. On the contrary, they are wholly compatible and complementary. The fact that in 1940 participating farmers seeded legumes and grasses on 41,220,347 acres and adopted better pasture practices on 31,036,879 acres is one reason why the defense production effort in 1941 is showing such excellent results. Farmers grew green-manure and cover crops in 1940 on 21,524,500 acres and applied 12,006,956 tons of limestone and 936,093 tons of superphosphate. They carried out on 41,573,013 acres various erosion-control practices, such as 280,758,000 linear feet of terracing and 20,273,000 linear feet of contour ridging. All of this work is now paying dividends in the food-for-freedom drive.

In line with defense needs the agricultural conservation program will place less emphasis hereafter on the historic base principle for determining acreage allotments and more on positive action to promote desired objectives both of conservation and of production. The 1942 program will include a minimum requirement for acreage devoted to soil-building and erosion-resisting crops. In many cases these are the crops that also serve defense requirements. Farmers who have exploited their land heretofore will thus have an additional inducement to grow protective crops that are also defense crops, while farmers who consistently have carried out sound practices will have a more ample reward. Emphasis in all ports of the country on conservation practices adapted to local conditions will contribute potently to the food-for-freedom program.

There is of course a reduction as well as an expansion aspect in agriculture's defense program. The need to limit production in wheat, cotton, tobacco, and some other crops that depend normally on

a large commercial export market, is greater than ever. As is recorded in the commodity sections of this report, farmers in 1942 recognized this need by voting for an increased use of marketing quotas. On crops subject to marketing quotas all marketings in excess of the quotas carry a penalty equal to 50 percent of the basic loan rate. Congress established this penalty in legislation passed last spring, while at the same time it made the basic loan rates higher. Marketing quotas, when they have been adopted by a two-thirds majority of the farmers concerned, apply to noncooperators as well as to cooperators in the AAA program. Consequently all producers have an incentive to plant within their allotments, so that they will be eligible to take advantage of other features of the national agricultural policy.

The first referendum ever held on wheat-marketing quotas was an event of the year. It took place on May 31 last, with wheat growers voting in 40 States. They will vote again early in 1942 on proposed quotas for that year's wheat crops. Quotas on the 1941 crop received the approval of 81 percent of the growers who participated in the referendum, and the size of the majority indicated a growing realization among the farmers that greater control of market supplies is a necessary part of the Government's price-supporting program. Peanut growers, also in a first referendum, approved marketing quotas. The vote, taken on April 26, 1941, approved quotas for the period 1941–43; the favorable vote was 87 percent of the total. It made possible the continuation of a peanut-diversion program under which loans and payments finance the use of part of the peanut crop for oil for by-products. As is mentioned in other parts of this report, cotton growers and tobacco growers reaffirmed the use of marketing quotas.

## Special Provisions Supplement Low Incomes

There are many farm families whose incomes are too small for adequate living standards. Subsistence farming is not the goal of the AAA and accordingly the AAA combines its price-strengthening measures with special provisions to supplement the income of such farmers. The program contains a schedule of small payments to increase the amounts earned by low-income farmers. In addition there is a maximum limitation on conservation payments to large operators. These provisions are a means of helping sustain family-size farms as the backbone of American agriculture. In order to enrich the diets of rural people in some cash crop areas where little food for home consumption is normally produced, special AAA payments under the 1940 program were made to 645,254 families for growing home gardens. This practice was extended in the program for 1941.

Cotton farmers benefited from a supplementary cotton program for 1941 which, in return for a further reduction of their acreage below their allotments, offered them about 25 million dollars' worth of cotton stamps to purchase greater quantities of cotton goods.

## Consumer Protection Important

Consumer protection remains one of the important aims of the AAA program. Prevention of food shortages is the consumer's best

safeguard. The AAA protects consumers by encouraging the production of commodities that are in demand, by keeping brakes on crops that are in surplus, by holding adequate crop reserves, and by maintaining fertility of the soil. Though food prices advanced in 1941, food during the first half of the year was still about a fifth cheaper than in 1929, and farm prices averaged about a fourth less. In fact the city consumer's food-buying power this year was the highest since World War I.

### AAA Looks to the Future

Like the other Federal programs for agriculture, the AAA program is being carried out with a view to the situation that may follow the war. It anticipates a continued subnormal demand for cotton and wheat and a continued need for larger pasture and grazing acreages to support dairy and livestock production. Farm adjustment along such lines will help prevent excessive growth of export surpluses and at the same time guard the soil and provide better diets for the American people.

Farm leadership developed in recent years will continue to be of the highest value in agricultural defense activities and in post-war planning and action. Nearly all the farmers in America are contacted directly through AAA committees of farmers elected democratically each year by their neighbors. These farmer committees, carrying out the program locally, are constantly taking over more responsibilities for applying national measures to the individual farm and for making recommendations to improve the program. County and community AAA committeemen and their alternates comprise a working force of farmers uniting with their neighbors to adjust farm operations to the changing conditions of modern times.

## THE COMMODITY LOANS

Organized in the fall of 1933 the Commodity Credit Corporation was originally an independent agency, and its loans were made chiefly to meet emergency conditions. In 1938, however, Congress authorized it to make loans on any agricultural commodity and directed it to make loans on cotton, corn, and wheat in any year in which certain prescribed conditions existed. The legislation was part of the Agricultural Adjustment Act of 1938. In this way the Corporation became part of the farm-program machinery. As such it was formally incorporated into the Department of Agriculture in the following year.

The Corporation has a capital stock of 100 million dollars and authority to borrow on the credit of the Government up to the amount of 2,650 million dollars. Consequently, its total resources are 2,750 million dollars. Its investment at the present time in loans and in commodities owned totals about 1 billion dollars. It has outstanding loans of nearly 400 million dollars in the hands of banks, cooperative associations, and other lending agencies. The remaining resources, when supplemented by loan repayments and proceeds from sales of owned commodities next season, should suffice to make necessary loans on the 1942 crops.

It is impossible, of course, to judge the commodity loan program all by itself. We have to see it in its relationship to the rest of the farm program, and its relationship to other Federal financing. Especially important just now is its relationship to our defense expenditures, which are already absorbing nearly one-fifth of the national income and seem likely to increase. The cost of defense obliges Congress to reconsider various nondefense activities and to consider ways of reducing or making them as nearly self-financing as possible. Linked with other aspects of the farm program the commodity loans are self-financing to some extent, but they involve losses. How effectively the self-financing feature works, what benefits the program develops which offset the losses, and how it might be made still more economical are matters that involve the entire farm program.

There was a self-financing adjustment program under the Agricultural Adjustment Act of 1933. Proceeds of processing taxes, levied at rates equal to the difference between the market price and the parity price of the commodities involved. went to producers who kept their plantings within prescribed limits. This plan made it advantageous to cooperating producers to have relatively low market prices, for such prices helped them in foreign trade, discouraged the competition of noncooperators, and had an offset in benefit payments. In January 1936, however, the United States Supreme Court put an end to the processing taxes, and the upshot was an increased reliance on the commodity loan principle, and consequently on the facilities of the Commodity Credit Corporation.

How this came about we can readily recall. Under the Soil Conservation and Domestic Allotment Act, which Congress passed to provide other means of financing agricultural readjustments, the programs of 1936 and 1937 made payments to producers who restricted their plantings of surplus soil-depleting crops, increased their plantings of soil-conservation crops, and carried out certain soil-building practices. These programs, however, did not prevent the accumulation of surpluses. Therefore Congress enacted the Agricultural Adjustment Act of 1938, which continued the conservation payments, provided parity payments besides, and under specified conditions authorized the use of marketing quotas supported by commodity loans. This is the program we have now.

With processing taxes eliminated and farm payments limited by the funds available, this program increases the importance of market prices. Consequently it enhances the importance of price-supporting loans. For example, conservation and parity payments made by the Agricultural Adjustment Administration this year roughly equal 15 percent of parity. It follows that if farmers are to get parity they must have prices at least equal to 85 percent of parity. This is where the influence of the loans comes in. Any advance in prices above 85 percent of parity, on the other hand, means a saving to the Treasury, since the law provides that farm payments must simply fill the gap. As prices rise, Federal payments decline. In other words the program tends to increase the dependence of the farmers on the market and on loans that support the market, and conversely to decrease their direct dependence on appropriations.

## Loans and Marketing Controls

There is a close relation between the loans and the marketing-quota system. The Act of 1938 provides that whenever parity payments plus conservation payments fail to keep supplies in line, recourse must be had to another expedient. Marketing quotas must be invoked. With marketing quotas in effect, the commodity loan funds required to sustain prices are less than they would be otherwise. In other words, the quotas help to make loans self-financing. Specifically, through the reciprocal effect of acreage allotments and marketing restrictions, they reduce the supply for which the price must be sustained. This reduces the cost of the operation.

Marketing-quota programs, however, are not revenue-producing measures. True, they collect penalties from noncooperators. But these are simply offsets to the special benefit that would accrue otherwise to the noncooperating group. They equalize the farmers' gain, but do not finance the marketing program. The associated loans increase the returns to agriculture far above any loss that may be incurred by the Treasury, because loans on part of a crop support the price for the entire supply. Frequently, farmers can repay the loans in full, in which case the Treasury incurs no loss. Moreover, some of the commodities delivered to the Corporation can be profitably sold. There are partial offsets to the Federal costs involved.

But expense remains which the system does not cover. Though it is small compared with the returns obtained for farmers, it must be kept as low as possible. One means of doing this is to develop full coordination among all the parts of the program, so that surpluses will not become excessive and will not flow too fast into the market place. Acreage adjustment, marketing quotas, reserve supplies, and commodity loans are merely aspects of a single program, the costs and benefits of which must be assessed as a whole. Without action by the farmers at the point of production and action also in marketing channels when surpluses pile up heavily, the loan system would break down.

## Keeping Down the Loan Costs

Needless to say, unnecessary charges should be eliminated and necessary charges kept reasonable. This benefits both the Government and the farmer. The Government pays the charges on unredeemed loan stocks while the farmer pays them on stocks that he redeems. Losses to the Corporation since it was organized in 1933 have averaged 10 percent of the amounts loaned. On corn and naval stores the losses have exceeded 10 percent, on corn chiefly because the Agricultural Adjustment Act of 1938 has provided for corn loans at rates higher than those on other commodities and on naval stores from the accumulation of stocks through the curtailment of exports. It may be difficult, with the higher loan rates now in effect, to prevent the loss rate from rising. Mounting surpluses mean danger.

Reserve supplies of some crops, notably wheat and cotton, are large. Storage costs are heavy, particularly on wheat. Large losses may result on wheat unless marketing quotas control supplies. Marketing quotas are effective with cotton, but difficulties may result if

prices rise out of line with the prices of competing products. There may again be difficulties with tobacco if an attempt is made to hold tobacco prices at too high a level. The purpose of the commodity loans is to prevent surpluses from depressing prices. Farmers will not be likely to repay the loans, and the Treasury will not be able to avoid big losses, if acreage allotments and marketing quotas fail to keep supplies in line, or if there is no expansion of the market by the Surplus Marketing Administration through the use of export subsidies, the stamp plan, the school lunches, and similar programs. One part of the farm program can work well only if all the other parts do.

### Loan Liquidations and Sales

Let us see what the Corporation has accomplished. More than one-half of the commodities on which it has made loans have been moved into regular trade channels, largely as a result of loan repayments. Farmers have sold the redeemed commodities on the market. Sales of commodities taken over by the Corporation have accounted for between one-fifth and one-fourth of the total moved into regular trade channels.

Loan liquidations and sales have been relatively high in recent months. Since March 31, 1941, farmers have repaid loans amounting to approximately 275 million dollars, while in the same period sales of commodities owned by the Corporation have amounted to approximately 100 million dollars. In fact, from April to September 1941, liquidations and sales exceeded new loans and purchases.

Loans have been made on approximately 532 million bushels of wheat from the 1938, 1939, and 1940 crops. Wheat loans outstanding September 30, 1941, covered approximately 8 million bushels stored on farms, and approximately 174 million bushels (mostly from the 1940 crop) in producers' pools. There is a separate pool for the 1939 crop. Net proceeds above advances and carrying charges, if any exist, will be paid to the producers when all the wheat in the pools is sold. Of the remaining 350 million bushels from these crops on which the Corporation made loans, approximately 20 million bushels became the property of the Corporation and were sold. Producers repaid the loans on 330 million bushels. Losses on wheat sold and released from the loan prior to March 31, 1941, approximate nearly 5.8 million dollars. Inventory losses as of the same date amounted to approximately 7.6 million dollars. Most of the loss occurred in a release program in 1939 on 1938 loan wheat. Loans have been made so far on approximately 300 million bushels of the 1941 wheat crop, and from 50 to 150 million bushels more may come into the loan.

Loans on cotton from the 1933 to 1940 crops inclusive have totalled about 1 billion dollars and have covered approximately 20 million bales. The loan rate for the 1933–40 period has averaged 10 cents a pound. Farmers have redeemed loans on approximately 13 million bales. On the other hand, the Corporation has come into possession of 7 million bales (1934 and 1937 crops). It has exchanged 600,000 bales of this cotton for rubber in the barter deal with Great Britain, and it is also supplying cotton to Great Britain under the lend-lease program. Export sales of 1937 crop cotton are currently being

made under a sales program of the Corporation and an export subsidy supplied by the Surplus Marketing Administration.

Losses to the Corporation on cotton disposed of up to March 31, 1941 amounted to 23.7 million dollars. Appraised losses as of the same date on cotton owned by the Corporation amounted to 33.2 million dollars, and brought the total losses on cotton up to 56.9 million dollars. Probably not more than 2 million bales of the 1941 crop will go into the loan because the production is below the estimated domestic consumption and exports for the coming year. In fact the quantity of cotton owned by the Corporation, plus that on which it will have loans outstanding at the end of the current marketing season, will be the smallest since 1937.

Loans on corn from the 1933–40 crops inclusive have covered approximately 1 billion bushels; the average loan rate has been 53.3 cents a bushel. Farmers have repaid loans on about 470 million bushels and have delivered about 290 million bushels to the Corporation. The Corporation has sold about 125 million bushels of the delivered corn and has about 165 million bushels still in its possession. In September 1941 the amount of corn under loan was about 240 million bushels. Losses on corn disposed of by the Corporation up to March 31, 1941, totaled about 19 million dollars, and the estimated inventory loss as of the same date amounted to an additional 63 million dollars.

Since then the Corporation has sold about 75 million bushels of corn. It has received prices for this corn at a level above the March 31 inventory value but slightly below the cost to itself. Actual losses have been increased somewhat in recent months while inventory losses have been substantially reduced. The loan experience with corn in 1933, 1934, and 1935 was more favorable than that of later years. In these early years farmers repaid practically all of their corn loans with no loss to the lending agency. Loans have been repaid to date on only 150 million bushels of the 635 million bushels which the Corporation took into storage from the 1938, 1939, and 1940 crops.

Loans have been made by the Corporation since 1931 on approximately 505 million pounds of tobacco with a face value of approximately 90 million dollars. Losses on tobacco disposed of up to March 31, 1941, amount to 2.1 million dollars. There was an additional estimated loss of 100,000 dollars on inventories. These losses, mostly on dark tobacco, were incurred before production had been adjusted to trade needs under the agricultural adjustment program. Losses on tobacco loans and purchases in recent years have been small.

Tobacco holdings this year have been greatly reduced. There are increased sales on the tobacco market and also increased export shipments. The Corporation is not holding any tobacco produced prior to 1939. It expects to have all all of its holdings of the 1939 crop moved before the end of the 1941 calendar year with the exception of a small quantity of dark air-cured tobacco. Practically all of the burley tobacco from the 1940 crop on which the Corporation made loans, and also some of its holdings of the 1940 flue-cured crop, have been sold.

Loans made by the Corporation on turpentine and rosin of the 1938–39, 1939–40, and 1940–41 crops have resulted in a large carry-over of rosin. The turpentine stocks, however, have been sold, and in the last few months the rosin stocks have been reduced. Actual and estimated inventory losses as of March 31 last were appraised at 7 million dollars, but this loss has since been reduced to about 4 million dollars.

Other commodities on which the Corporation has made loans since 1933 include barley, rye, grain sorghums, wool and mohair, butter, peanuts, prunes, raisins, hops, figs, dates, and pecans. Loans on rye, barley, and grain sorghums are being continued in 1941, and loans on soybeans and flax have been added.

Some of the loans on the above-mentioned commodities have been of the merchandising type and have been completely liquidated without loss. On all the programs in the above-mentioned group of commodities, the actual and estimated inventory losses have totalled about 1.5 million dollars.

## FARM CONDITIONS IN 1941

In the summer months the prices of wheat, corn, cotton, tobacco, and rice advanced sharply, partly as a result of higher loan rates established for these basic commodities and partly as a result of improved demand. Advances took place likewise in the prices of livestock, dairy products, and poultry products. In these lines the stimulus came chiefly from the National Defense Program, with its addition to consumer buying power, and from Government support of hog, dairy, and poultry prices to increase the supply available for domestic consumption and for export to Great Britain. Early crop reports indicated a total agricultural production somewhat larger than that of 1940. Crops and livestock were in good condition; feed was abundant; and producers were responding vigorously to the defense call.

On basic crops, with loan rates available at 85 percent of parity, it seemed likely that the return to producers would be close to the parity goals. Parity depends, however, on the prices of the goods and services that farmers buy, as well as on the prices of the goods they sell. As the year advanced, the index of the prices paid by farmers moved upward; there were indications that the upward movement would continue. Farm wages were the highest in 11 years; other farm costs of production were higher than in 1940. There was consequently some chance that the parity goals would advance still further, through advances in prices paid by farmers. Further advances seemed likely in both farm and nonfarm prices, but whether the outcome would be a wider or a narrower disparity was uncertain.

Many factors appeared to favor agricultural prices. Employment and pay rolls in industry rose steadily; after the strikes of the spring months industrial production mounted sharply. Expenditures for defense production in May were at the rate of about 900 million dollars a month, as compared with only 17 percent of that amount in May of 1940. Further increases were in prospect for the duration of the defense emergency, with the probability that the resulting

increased consumer incomes would go freely into agricultural commodities. Spending for nonfarm goods, on the other hand, ran up against the obstacle of defense priorities. Farmers received higher prices than in midsummer 1940 for practically all farm commodities. In fact the general farm-price average was 25 percent higher than at the outbreak of the war.

### Wheat, Corn, and Livestock

Estimates of the wheat crop indicated that it would be one of the largest on record and would make the total supply available larger than in any previous year. Adding the winter wheat harvested and the expected outturn of spring wheat to the 1941 carryover gave a supply of some 1,345 million bushels as compared with 1,099 million bushels in the 1940–41 season. The impending surplus and provision for higher loans caused wheat growers to approve marketing quotas for the year's crop. This action gave them the assurance of continued wheat loans, available under the new congressional enactment to AAA cooperators at 85 percent of parity and to noncooperators on their excess wheat at 60 percent of the loan rate to cooperators. Under the quota system the marketing or feeding of wheat from acreages in excess of the allotment became subject to a penalty of 49 cents a bushel.

Cotton prices rose sharply after Congress passed the 85 percent of parity loan-rate act. In mid-July they reached the best levels since 1930. The spot markets in mid-July averaged 15.6 cents a pound, as compared with a little over 10 cents in July of 1940. These higher prices enabled growers to take much pledged cotton out of the commodity loans. Domestic cotton consumption rose to a new high record. There was no improvement, however, in the cotton-export trade, which declined over 80 percent from the previous year. Exports of raw cotton from the United States for the 1940–41 marketing season were only about 1 million bales. In the 1941–42 season exports may be even smaller. Practically all will be under the lend-lease law or under some other Government program. Since late in the 1940–41 season, domestic prices for cotton have been more or less divorced from foreign prices and the demand for cotton in other countries.

In the livestock industries both the earnings and the outlook were exceptionally promising. Though the number of cattle and calves marketed for slaughter during the first 6 months of 1941 was about 5 percent larger than a year earlier, the increased marketings brought higher prices. Larger market supplies did not offset the increase in consumer buying power. Prices of the better grades of slaughter cattle, however, did not advance in the late summer and fall as much as they did the year before. Marketings of fed cattle were large. The plans of growers for withholding breeding stock will be important in cattle market conditions next year and thereafter. The Department urged cattlemen to plan for increased marketing within the next 2 years. If they build up their herds for a longer period, the result may be overexpansion in a declining phase in the consumer demand.

From the supply and demand standpoint, the situation was even more favorable to hog producers. Marketing of hogs was smaller this year than last, while the requirements were considerably greater. The relationship between hog prices and corn prices was favorable to the feeding of corn to hogs. Output from the pigs produced in the fall of 1940 was 10 percent smaller than the output from the fall pig crop of 1939, and as a partial offset to the shortage the Department urged farmers to feed their animals to heavier weights. In its own purchases under the Lend-Lease Act it emphasized the heavy-weight cuts. As a result of this and other factors in the hog market situation, the rise of prices was considerably greater on the heavy than on the light hogs. There was a marked increase in the number of sows bred for fall farrowing. It seemed likely that the spring pig crop of 1942 would be much larger than that of 1941.

Lamb producers had the best season in many years. Prices of lambs were above those of the previous year and above parity. The early lambs made good growth. Marketings of these lambs and also of Texas yearlings were heavy; yet continued improvement in the consumer demand prevented the heavy marketings from depressing prices. In fact the midsummer seasonal decline was less than that of last year, though it should be noted that the summer decline of lamb prices in 1940 was exceptionally great. Farmers received higher prices also for wool; indeed, the wool price level was the highest in 10 years. With mill consumption at a record level to fill Army orders and civilian needs, wool prices seemed likely to go still higher. Shipping difficulties curtailed wool imports. One effect was a widening spread between the market prices of shorn and of wooled lambs.

## Dairy Conditions

Milk production was higher this year than ever before. There was a higher-than-average milk flow after the flush-production period. The Department called for an increase in dairy production on a national basis of from 6 to 8 percent and thought it might have to raise the estimate of requirements. It specially emphasized the need for increased production of cheese and evaporated and dried skim milk and for building up our reserves of dairy products. The ratio between feed prices and the prices of dairy products was favorable for an increase in dairy production. Specially notable was the trend in May and June toward higher instead of the customarily lower prices in those months for fluid milk. Only a few markets reported seasonally lower prices. The demand for manufactured dairy products under the National Defense Program absorbed the usual seasonal increase in milk production and called for more.

Cold-storage operators, who did well in the 1940–41 season, had continued favorable conditions. Enhanced consumer buying power assured them that accumulated stocks could be liquidated readily. Stocks of butter on July 1 were 48 percent larger than those of a year earlier, and stocks of cheese were 24 percent larger. Yet the prices of butter and cheese in the wholesale markets were the highest for that month since 1929. In fact the Government had difficulty in buying enough cheese for lend-lease export, though it supported

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dairy prices on a basis calculated to encourage cheese production. It specially urged an increase in the output of milk in States that have large milk-processing capacity. There was every prospect that a good storage demand for dairy products would continue.

## Situation in Various Crops

Shortages created by ocean-shipping difficulties strengthened domestic demand and caused advances in the prices of most fats and oils. There were corresponding advances in the prices of oilseeds. The July estimate of the cotton acreage indicated a somewhat smaller production of cottonseed than in 1940. Producers planted slightly less flaxseed this year than last and a somewhat reduced acreage of soybeans for all purposes. Acreage of soybeans harvested for beans was increased in response to a Government request. The Government did not request an increase in flaxseed acreage. This country had enough flaxseed on hand to meet crushing requirements until the new crop became available, but imports of flaxseed may be needed for crushing in the first half of 1942. In the first half of 1941 the imports of flaxseed totaled over 7 million bushels; but there was a possibility that the imports could not be maintained at that rate for the rest of the year.

In egg production, though the midsummer decline was about average, the total was slightly larger than in the summer of 1940. Encouraged by a strong consumer demand and improved prices, poultry producers increased their hatchings. Egg production consequently increased markedly in the later months of the year. With 14 percent more young chickens raised on farms than in 1940, the response to the call for increased egg production promised to be adequate. The number of layers on farms in the late fall was considerably larger than a year previous; it pointed to a sizable increase in the production of eggs for a market that showed many signs of continued improvement. Chickens brought higher prices than in the fall of 1940, and the outlook for chicken prices was favorable despite the expectation that supplies of poultry meat would be largely increased.

The relationship between egg prices and feed stimulated egg production. Prices received by farmers for eggs on June 15, for example, averaged 23.2 cents per dozen—the highest for the month in 12 years. Average cost of a farm poultry ration on the same date was at moderate levels—$1.33 per 100 pounds. At these prices it required only 5.72 dozen eggs to buy 100 pounds of ration, compared with 8.45 dozen last year and the 1930–39 June average of 7.67 dozen. Chicken prices in June were the highest for the month in 10 years, and turkey prices improved. Farm holdings on July 1 confirmed the expectation of a substantial gain in numbers of young chickens raised. The average number per farm flock was 141, compared with 125 last year—a gain of almost 13 percent. The number on farms in July was higher by 5 percent than the 1930–39 July 1 average and was the largest for that date since 1936. Hatchery production of baby chicks during the first 6 months of 1941 was a high record. The estimate was 912,869,000 chicks, compared with 734,774,000 chicks during the first half of 1940.

## THE YEAR'S PRODUCTION

The year was outstandingly favorable, and crop production was somewhat above last year's abundant outturn. Only 1937 exceeded 1941. Both food and feed crops were well above average. With few exceptions, the agricultural industry was able to meet the defense call for changes in production.

The wheat crop approached a billion bushels for the third time in history; yields were unusually high of both winter and spring wheat. The cotton crop, however, was unusually small, largely because of greatly reduced acreage; the yield per acre was 12 percent above average. Tobacco production was less than in most recent years.

Feed-grain production was above average, though below prospective feeding requirements. Some further utilization of the large stocks accumulated in recent years will undoubtedly occur. The hay crop was the largest since 1927; if the winter is normal it will be sufficient to feed the increased livestock population at about the usual rate without drawing on reserves.

The crops of barley, rice, grain sorghums, dry beans, dry peas, soybeans, and total commercial vegetables exceeded production in any previous season. The flaxseed crop was larger than in any year except 1902. The peanut crop was second to the record crop of 1940, and production of corn, oats, rye, sugarcane, and sugar beets was well above average. Production of potatoes and sweetpotatoes barely exceeded the average. Fruit production was close to previous high records.

The wheat crop of 957,563,000 bushels (September 1 estimate) was second only to the 1,008,637,000-bushel crop of 1915. The average production of recent years has been 747,507,000 bushels. The bumper crop resulted from unusually high yields in all wheat-producing areas, particularly in the main spring-wheat States. Acreage was only slightly above average.

The corn crop of 2,523,964,000 bushels was 9 percent above the 10-year (1930–39) average of 2,307,452,000 bushels. A further increase took place in the acreage planted to corn hybrids and, in the face of distinctly adverse weather during mid-July and early August, yield per acre was almost 6 bushels above average. This year over a third of the Nation's 87 million acres of corn was planted with hybrid seed. In Iowa, Illinois, and Indiana the percentages planted to hybrids were 95, 87, and 80, respectively.

The 1941 oats crop of 1,129,757,000 bushels was 12 percent above average, but it was smaller by 106,000,000 bushels than last year's large crop.

The cotton crop on October 1 was indicated at 11,061,000 bales. This was 12 percent less than 1940 and 17 percent less than average. The crop was particularly poor in the eastern and central parts of the belt from South Carolina to Louisiana. For all cotton States the indicated yield averaged 234.2 pounds per acre, which was considerably less than the 252.5 pounds harvested in 1940 but well above the 10-year average of 205.4 pounds per acre.

The total harvested acreage of crops for the second successive year shows a slight increase. Of important crops there are 325,224,000 acres for harvest in 1941. Of these same crops, 320,288,000 acres were

harvested in 1940, and the 10-year (1930–39) average acreage was 328,379,000. Increased acreages were shown for all grain crops except corn, flax, and grain sorghums. The hay acreage continued to expand slightly, and material increases were shown for such crops as dry edible beans, peas, and sweetpotatoes. Corn acreage and flaxseed acreage were slightly less than that in 1940. The cotton acreage, as well as that for soybeans, peanuts, and potatoes, decreased about 5 percent. Tobacco acreage was less by 2 percent, and sugar beets by 17 percent.

The upswing in total livestock numbers, which started in 1938 and continued during 1939, tended to level off during 1940, and the number of animal units on farms at the beginning of 1941 was only a little larger than a year earlier. The declining trend in hog production was checked in the spring. With a spring pig crop practically the same as in the preceding year, combined with a sharp increase in fall farrowings, the total pig crop of 1941 is indicated at about 5 percent more than in 1940. The 1941 lamb crop set a new high record. The number of cattle on farms January 1 was much above the number a year earlier and pointed to increased cattle production. Enough more pullets were kept from the 1941 record hatchings to increase farm flocks for next year's laying season by as much as 8 percent. The turkey crop was about the same as last year. Milk production is indicated at about 5 percent above that of 1940 and egg production about 3 percent above.

## Dairy and Poultry Production

Milk production during the first 8 months of 1941 totaled 81.6 billion pounds, about 5 percent above that in the same period of 1940. With favorable full pastures a heavy milk flow was in prospect for the remaining months of the year, and a production of nearly 117 billion pounds seemed probable for 1941. This would be 6 billion more than in any previous year. Most of the increase in milk production was absorbed in the heavy production of manufactured dairy products. From May 1 through August the production of American cheese exceeded the record production in the same months of last year by over 38 million pounds, or 14.5 percent. Evaporated milk production increased 20 percent. Creamery-butter production increased 50 million pounds, or 6.6 percent. The increased butter production went into cold storage; this permitted further diversion of milk to cheese and evaporated-milk production during a period of the year when the cheese factories and condenseries are able to handle the additional milk.

Egg production during the first 8 months of 1941 was the largest since 1930. Egg production per laying hen was substantially above average in every month of the year, but it was not until July that the number of layers was equal to average. In January the number of layers was about 2 percent below average. Under the stimulus of higher prices for eggs, culling appears to have been less than usual. Probably in the closing months of 1941 the number of hens will increase slightly in relation to the same months in 1940. The very large increase in number of pullets on hand should bring about a substantial increase in the number of layers by the beginning of

1942. Hatchery production of baby chicks for the first 8 months of 1941 was 962 million, or 14 percent larger than the previous high record in 1939. The number of pullets not yet of laying age on September 1 was 9 percent larger than a year earlier. Consequently an increase in the number of layers of from 8 to 10 percent is to be expected when these pullets enter the laying flocks.

During the first 8 months of the year, 2,594 million dozens of eggs were produced on farms, an increase of 3.3 percent above 1940. The 1941 total may reach over 3,300 million dozens on farms, or 3,600 million dozens counting nonfarm production. This would be close to the record farm production of 3,256 million dozens in 1930 and 10 percent above the 10-year (1930–39) average. In view of the favorable supply of feed, a goal of 4,000 million dozens is attainable in 1942, provided feed prices remain within reasonable bounds.

## Fruits and Vegetables

Fruit production in 1941 was close to previous high records. On September 1 indicated production of the 8 major deciduous fruit crops combined (peaches, pears, grapes, cherries, plums, prunes, apricots, and commercial apples) was about 12 percent larger than in 1940 and 10 percent above average. With the exception of cherries, production of all these crops was above last season. Early prospects of citrus production from the 1941 bloom were for a production slightly less than in the 1940–41 season.

The Department's program to increase the output of products needed in the National Defense Program emphasized tomatoes for canning. Other canning crops felt the effects of the program. About 17 percent more acreage was planted and favorable growing conditions indicated better than average yields. Sweet corn processors expanded 1941 plantings more than 30 percent and produced a record crop of 1,089,000 tons. A harvest of green peas for canning of 348,000 tons was 13 percent larger than in 1940. The crop of tomatoes for canning and production of tomato products reached a record high production of 2,421,000 tons. In 1940, 2,275,000 tons were produced; the average is 1,580,000 tons.

Truck crops for shipment to fresh markets declined slightly in acreage. The potato acreage was decreased by 5 percent; but, with yields above average, a production of 373,853,000 bushels, or 1 percent above average, was reported. Sweetpotato acreage on the other hand was increased by about 9.2 percent; yields were well above average, and the crop of 73,949,000 bushels was 19 percent larger than the 1940 crop though only 1 percent larger than average. There was a substantial reduction in the planting of onions—only 95,000 acres were planted as compared with an average of 125,000, but the indicated production of 13,833,000 sacks is only 5 percent below the 10-year average. The acreage of cabbage was also reduced from 1940 but was still slightly above average; production was nearly 5 percent above the 10-year average.

The commercial apple crop of 128,322,000 bushels was well above the 1940 production of 114,391,000 bushels. Production was substantially above average in the Central States and about 4 percent above in the Eastern States, but 9 percent below in the Western States. Pro-

duction of peaches in the Southern States was relatively large, South Carolina setting an all-time record. In the North Atlantic States production was also well above average, while in the North Central States a very large peach crop was harvested. The California peach crop was somewhat below average. The pear crop was about as large as in 1940 and 16 percent above average. Total grape production of 2,599,020 tons was well above the average crop of 2,264,062 tons. Most of these grapes were produced in California, where the crop was relatively large. The California crop of dried prunes was 199,000 tons, which was somewhat less than the 10-year average production of 207,100 tons. Production of prunes for all purposes in the Pacific Northwest was 154,400 tons, or slightly less than the 10-year average of 159,420 tons.

## Cash Farm Income for 1941

In the first half of 1941 the cash income from farm marketings was 17 percent higher than in the first half of 1940. Early crop reports, along with the trend in farm prices, indicated that the cash income from marketings for the full calendar year might be as much as 10.5 million dollars, as compared with 8,357 million dollars in 1940. This estimate includes the returns to farmers from crops placed in the various commodity loans and also profits realized from the redemption of wheat and cotton pledged for Government loans last year. Farm income for 1941 will be the largest for any year since 1929, when the total was 11.3 billion dollars. The highest recorded cash farm income in the last 30 years was that of 1919, 14.4 billion dollars.

The largest percentage increases in income from 1940 to 1941 are expected in the returns from wheat, cotton, hogs, wool, dairy products, and poultry products. Higher loan rates on wheat, together with the second largest crop on record, are resulting in a sharp increase in wheat income. Cotton production is down somewhat from that in 1940, but prices thus far in the season have been sharply higher than a year earlier. A continuation of these prices would result in the largest returns from cotton in more than a decade. Income from most other crops is also expected to total more than in 1940.

The increase in income from livestock products in 1941 may be nearly as great as the income from crops. Marketings of most livestock and livestock products are at or near record levels, and prices are considerably higher than they were in 1940. Marketings of hogs for the year as a whole are expected to be less than in 1940, but prices have been sharply higher, and income from hogs will be substantially higher than a year earlier.

It is impossible, however, to judge the condition of the farmer just from his income. What that income will buy is important, as is also what it has to buy. Farmers can now buy approximately 35 percent more with their gross income than they could in the period 1910–14. This does not mean, however, that they are that much better off. Farm specialization obliges farmers to buy many things that formerly they produced for themselves. They have more income, but also they have more outgo. Recently the Department pub-

lished estimates of the net income of persons on farms from farming since 1910. The total net income for 1940, with Government payments excluded, when deflated by the index of the cost of living on farms, had only 98 percent of the purchasing power that the annual net farm income had in the period 1910–14. Adding in the Government payments raised the percentage to 112. In other words the increase in farm buying power for family living was only about one-third of the increase in the buying power of the gross farm income.

## THE COTTON PROBLEM

Cotton producers generally have fared better this season, despite their loss of export outlets, than they have fared for more than a decade. The prices of lint have been the highest since the 1929–30 season, and the prices of seed the highest since 1923. This year's crop will give a gross return from marketings in excess of one billion dollars. It will be the first cotton crop to do so since that of 1929. With Government payments added, the returns to the growers will exceed the returns they received for the crops from 1930 to 1939 by from 10 to more than 100 percent.

In the relatively high lint prices of recent months an important factor was the Government cotton loan at 85 percent of parity; it was required by an act of Congress approved May 26 last. In the prices of cottonseed the Government's buying of lard and dairy products for export under the Lend-Lease Act was a factor. This and the reduced imports of oilseeds and oils have raised the prices of lard and other products which compete with cottonseed oil. Additional support to the prices both of lint and of seed came from the increase produced in consumer-buying power by the National Defense Program. Also the Government made large purchases directly of cotton products. Several of its surplus removal programs contributed to the relatively high lint prices. Moreover, the cotton crop was small. The advance in general commodity prices and the accompanying discussions of price inflation are also considered important factors in the higher prices of both lint and seed.

Cotton consumption rose markedly during the year. In July it reached a new high. In the 1940–41 season the domestic consumption reached approximately 9¾ million bales or nearly 2 million bales more than that of the preceding season. Besides the high rate of mill activity, the Department's mattress program contributed to the high consumption rate. The mattress program provided nearly 400,000 bales of cotton to low-income families for making mattresses and other comforts. Several other surplus-disposal programs conducted by the Government added something to the total, especially the export subsidy program. Subsidy payments were made on cotton products equal to approximately 600,000 bales, at rates two to three times as great as those of the 1939–40 season. In the 1939–40 season, the first year of the program, payments were made on cotton products equivalent to about 400,000 bales. Other surplus-disposal programs affected smaller quantities; they included a program to encourage the use of cotton-bagging material as a covering for cotton bales; the cotton-insulation program; the cotton-stamp plan; and efforts to stimulate the use of cotton in high-quality writing paper.

The large domestic consumption last season was a partial offset to the drop in exports. In the year ended July 1 our exports of cotton were just over 1 million bales, the smallest total since the Civil War period. They would have been still lower had we not shipped some barter cotton to Great Britain and a substantial quantity of cotton to the Union of Soviet Socialist Republics. The exports to the U. S. S. R. were the first since 1934. In the 1939–40 season our cotton exports amounted to nearly 6¼ million bales. Even that amount, however, was below the 10-year average, though it included some subsidized shipments and reflected also the accumulation of war stocks in several countries. Obvious handicaps to our cotton export trade in the 1940–41 season were the closing of the continental European market and the hostilities in Asia. Only a few countries were still able to import cotton. Great Britain and Japan, the most important of these, found their outlets for cotton goods restricted and their need for other kinds of production much increased. By decree they reduced the quantity of raw cotton available to mills and also the quantity of cotton goods available to consumers.

Another handicap to our cotton-export trade was the price disparity between American and foreign growths. This disparity, which was already large, widened still more toward the end of the marketing season, through the influence of the prospective higher loan rate for the 1941–42 season. It is significant that Brazil's exports of cotton during the 1940–41 season were about one-fifth larger than the average for the 5 previous years; whereas our own were four-fifths smaller. The drop in our exports resulted in a carry-over in this country on August 1 last of more than 12 million bales, second only to the record carry-over of 13 million bales in 1939. But the increase in the carry-over was about offset by the reduction in the 1941 crop. In fact the supply for the current season is slightly less than that of last season. Domestic utilization will probably again set a new high record despite a sharp reduction in the mattress program. But exports are likely to remain exceptionally low. Consumption plus exports may exceed the relatively small 1941 crop thereby reducing the carry-over somewhat. Nevertheless the carry-over on August 1, 1942, will continue exceptionally large.

Reduced supplies of fertilizer for use on cotton, the need for further changes to conserve the soil, and the need to provide more and better food for rural people in the South, add to the desirability of shifting from cotton to other products wherever practical. In a number of areas such shifts would represent a desirable change in the prevailing farming systems. These considerations were involved in establishing the 1942 cotton-planted-acreage goals of 22 million to 24 million acres. This compares with a planted acreage of 23⅔ million in 1941, when unfavorable weather and the supplemental program (whereby farmers were given cotton stamps for planting below their allotments) probably reduced the planted acreage considerably.

## The Future of American Cotton

What is ahead for American cotton no one can definitely say. The outcome of the war will largely determine it for many years to come. We cannot hope to export much cotton—or anything else for that matter—in an Axis-dominated world. Our best means of avoiding perma-

nent adjustment of cotton production to approximately domestic consumption requirements lies in resisting the forces of aggression. With Axis domination prevented, we shall have an opportunity to work out the problem through international cooperation. But I think we have to assume that a considerable degree of economic regulation will continue in this country and elsewhere in any event.

The United States has been losing its international cotton trade for more than a quarter of a century. The decline has been both absolute and relative. In the 5 years before 1914 we produced about 13 million bales and exported approximately 9 million bales of cotton annually. In the 5 years 1935–39 our production was about the same, but our exports averaged only 5½ million bales annually. Greater domestic consumption of cotton and Government financing of accumulated stocks have enabled growers during the last 5 years to dispose of an average production approximately equal to the pre-1914 level. This would hardly have been possible except at very low prices had the Government not acted.

In the 5 years before World War I, cotton shipments of about 500 million dollars a year accounted for a fourth of our total exports. Cotton exports were about equal to our total excess of exports over imports. Cotton enabled us to pay off our debts to foreign countries. It helped us finally to become a creditor nation. But the change was not favorable for cotton, especially in view of the increased trade barriers imposed against imports of foreign goods into the United States. Our foreign customers could no longer buy it from us in the usual volume, and cotton in our foreign trade declined. Recently we have supplied only a fourth of the cotton used in the mills located outside of the United States, as compared with almost 60 percent before World War I.

Hereafter we should develop a cotton program with features that will help to maintain exports. It is, of course, impossible to sell cotton abroad at prices above what the world market is able and willing to pay. There must be an effective separation between the domestic and the world price level. Yet our cotton-adjustment and cotton-loan programs are much more largely the result than the cause of the export difficulty.

It became evident years ago that forces were operating to the disadvantage of our cotton export trade. International trade in cotton failed to keep step with world production of cotton. In the period 1925–29 only about half the world's cotton production entered international trade, as compared with two-thirds in the period 1909–13. In the 1930's this downtrend accelerated. In the 5-year period ended with 1939 only about two-fifths of the world's cotton production entered world trade. Average annual world production of cotton in the period 1935–39 was 30.9 million bales, some 10 million more than in 1909–13. Yet international trade in cotton was slightly smaller in the 1935–39 period than in the 1909–13 period.

Prior to World War I, Great Britain exported as much as 7 billion yards of cotton cloth annually, most of it manufactured from American cotton. In the years immediately prior to World War II British exports of cotton cloth averaged less than 2 billion yards annually. Some of the decline in Great Britain's exports of cotton piece goods was the result of Japanese competition, but a more important factor was the

development of cotton textile industries in India, China, and other important cotton-cloth importing countries. These countries tended to use largely domestically produced cotton, the output of which expanded with their textile industry. Self-sufficiency became more universal, both in the production of cotton goods and in the production of cotton.

## Competition of Rayon

Meantime the production of rayon and other synthetic textiles expanded. In 1940 rayon and staple fiber production advanced into second place among the world's textile fibers. World production was estimated at 2,381 million pounds, as compared with 457 million pounds in 1930, and only 33 million pounds in 1920. It was equivalent to more than 5 million bales of cotton. Germany, Japan, and Italy accounted for 1,675 million pounds, or 70 percent. In rayon-staple fiber, the form of rayon that is most directly competitive with cotton, these three countries accounted for 89 percent of the world's production. Rayon-staple fiber production in 1940 totaled 1,237 million pounds, the equivalent of slightly less than 3 million bales of cotton. The United States prior to 1936 was the leading rayon producer; it now ranks third. It produces 20 percent of the world total of rayon and rayon-staple fiber as compared with 35 percent in Germany and German-dominated countries, 22 percent in Japan, 14 in Italy, and 6 in Great Britain.

Countries that formerly imported a large part of their textile requirements in the form of raw cotton, cotton yarns, or cotton cloth, now supply an increasing proportion of their requirements either from domestically produced cotton or from domestically produced rayon or staple fiber. Manifestly the prospects of an increase from the 1935–39 level of raw cotton exports are not bright. Continuation of the existing trends means that the cotton-exporting countries will find themselves competing for a gradually dwindling market. Our own producers will have to be aggressive competitors. Considerable losses in recent years have resulted to us from the competition of a rapidly expanding cotton-growing industry in Brazil and numerous smaller producing countries. In the aggregate, nevertheless, these losses have not been as important as the losses from increased use of domestically produced cotton and synthetic fibers in foreign countries.

## Need To Go After Foreign Markets

Foreign countries undoubtedly can and will produce large quantities of high-quality cotton at prices substantially less than the present price of American cotton. The cotton-producing capacity of South American countries alone is tremendous. These and other countries must produce for export; apparently they do not possess the basic mineral resources required for the development of a well-balanced national economy. It follows that the United States will have a struggle on its hands to keep its place in the world's cotton market. The market will not come to us. We shall have to go after it. As one means, the Government will do everything it can to bring about an international cotton agreement.

On the domestic side the picture is much brighter. Our own consumption of cotton has been increasing gradually over a long period. It is now at a very high level. Stimulated by defense orders, the cotton-mattress program, and increased consumer incomes, domestic cotton consumption this past season was by far the largest on record. It may even be possible to increase this consumption during the defense effort. Whether or not we can maintain the level afterward depends largely on the extent to which we can develop constructive peacetime programs, which will fully utilize our productive resources. The major factor in cotton-goods consumption in this country is the purchasing power of consumers.

Some further reduction in our cotton output seems necessary to protect the cotton price-insurance program. Essentially this is what the cotton growers have in the 85-percent parity loan. The term "price insurance" describes accurately the nonrecourse commodity-loan program. The premiums which farmers pay for this insurance are in the form of acreage adjustments and compliance with marketing quotas. If farmers do not pay this premium, in other words, if they do not firmly regulate their production and marketing, the insuring agency—the Commodity Credit Corporation—will suffer enormous losses which will have to be made up by the Federal Treasury.

The situation with respect to stocks of cotton is far from satisfactory. At the beginning of the 1941–42 season we had more cotton on hand in this country than was consumed in and exported during the current year. The Commodity Credit Corporation owned more than 6 million bales of this carry-over, and a substantial additional quantity was under loan. Since 1933 the Commodity Credit Corporation has made loans on approximately 20 million bales of cotton. These loan programs have added hundreds of millions of dollars to the incomes of cotton farmers. They have become a very important part of the farm program. It is essential, however, that they be properly protected by production adjustment, marketing quotas, export operations, and surplus-disposal operations.

Under the farm programs that have been in effect during the past 8 years cotton producers have been encouraged and assisted in conserving their soil, improving their cultural practices, and diversifying their crops.

## HANDLING THE WHEAT SURPLUS

The adjustments that the farmers have made in their wheat acreage in recent years, through successive AAA programs, have reduced our wheat supply below what it would have been otherwise. Nevertheless, for the 1941–42 season it is of record size. There was a large crop in 1940, and the war hampered export movements. In consequence, the carry-over on July 1, 1941, was 387 million bushels, as compared with the previous record carry-over of 375 million bushels in 1933. The wheat acreage this year was well below that of 1937 and that of 1938. In those years national wheat-acreage allotments were not in operation. But yields per seeded acre this year were of record size.

In the 1939–40 season our wheat exports were only 45 million bushels; in the 1940–41 season they were only 34 million bushels. These figures may be compared with exports of about 100 million bushels in each of the two immediately preceding years. Under the world trade

conditions that prevail now it would be difficult to obtain an increase in our wheat exports. Only a small export movement can be expected from the continuation of export subsidies. What will happen when the war stops depends on many things, such as the trend of consumption in wheat importing countries, the policy they adopt with regard to their own wheat production, and ease or difficulty that attends efforts to remove world-trade barriers. Negotiations are in progress now for an international wheat agreement. They look toward more orderly marketing by exporting countries, some enlargement of international trade, and more stable prices. At best, however, it is not likely in the years that immediately follow that the export price of wheat will be near our parity-price level.

It is probable that the carry-over in the United States on July 1, 1942, will again show a material increase. In fact our wheat stocks on that date will set an all-time record for the carry-over of wheat for any country. The AAA in May last announced a wheat-acreage allotment for 1942 of 55 million acres, the minimum allotment authorized by present legislation. Average yields on that acreage would give a crop of only about 650 million bushels—about 300 million bushels less than the 1941 crop. That will be more than enough reduction to offset the indicated increase in the carry-over. In other words, if the 1942 acreage approximates the allotments and yields are not above the average, the 1942–43 supply may be slightly smaller than the 1941–42 supply.

## The AAA Objective

In AAA wheat planning the announced purpose is to adjust the acreage allotment so that with the prospective carry-over it will provide wheat enough for normal domestic consumption, normal exports, and at least a 30-percent reserve. The 55 million acre allotment minimum, however, is above the level necessary to provide this objective. Hence, above-normal reserves will tend to be a part of our wheat situation until the world situation again provides a larger export market, or unless the yields run below the average for a period of years. Under present conditions, of course, an ample carry-over of wheat is desirable, because we may have a vital use for it both during and after the war—it may be the means of life and hope to countless millions in both Europe and Asia.

It goes without saying that the sea blockades mean low export prices as well as low export movements. Our farm price equivalent of the world price during the selling of the 1940 wheat crop was about 45 cents. This figure is calculated on the basis of the indemnity that was necessary then to export wheat from the United States. Farmers in this country of course received more than the world-price equivalent for their wheat. Actually, for wheat marketed in the 1940–41 season, they received an average of 68 cents a bushel. The difference was the result largely of the Government's commodity-loan program, which supported the domestic price. Contributory factors were the acreage adjustment and the export subsidy.

This 68-cent average was, nevertheless, far below the parity objective of the Agricultural Adjustment Act. As mentioned elsewhere in this report, Congress under a new enactment (Public No. 74, 77th Cong.,

approved May 26, 1941) authorized loans on basic crops at 85 percent of parity at the beginning of the marketing year July 1. Applied to wheat this 85-percent principle represented a national loan rate to farmers of approximately 98 cents a bushel. The adoption of marketing quotas gave farmers the assurance of continued wheat loans, which are available to AAA cooperators at the 85-percent rate and to noncooperators (on their excess wheat) at 60 percent of parity. In addition to the loan privilege, which amounts to a guaranty of 98 cents on the farm, growers have wheat parity and conservation payments. These amount to an average of 18 cents figured on a per bushel basis. Hence, program cooperators in 1941 will receive a total return of about $1.16 a bushel. That is approximately the July 1, 1941, parity price.

Cash farm income from wheat in 1940, exclusive of parity and conservation payments, was about 447 million dollars. It was 15 million dollars more than in 1939 and 47 million dollars more than in 1938. Yet marketings were smaller than in either of the two preceding years. Prices this year are materially higher and the crop is very large. Hence, the cash farm income from wheat will show a marked increase over that of 1940; it may be the largest since 1929.

## The Export Subsidy Program

It is not likely, in view of the large downward adjustments that wheat growers have already made in their acreage, that further reductions will be practicable except possibly on a very temporary basis. One year of lower than average yields, on the present allotted acreage, would adjust the supply position considerably. It will continue to be necessary, however, with prices materially above world export levels, to maintain the export-subsidy program. The export-subsidy program has been operated by the Department heretofore with funds from tariff revenues. In the marketing year 1938–39 it effected export sales of 93 million bushels of wheat and of flour in terms of wheat; the cost was 26 million dollars. It represented an average cost to the Government of about 28 cents a bushel.

In the marketing year 1939–40 the Government financed export sales of 35 million bushels of wheat. The total cost of the operation was 10½ million dollars, or an average cost of about 30 cents a bushel. In the 1940–41 marketing year sales under the export-subsidy program were smaller, chiefly because of the war. They amounted to only 22 million bushels and were financed at a total cost of 4½ million dollars, or an average of 21 cents a bushel. Considerable quantities of wheat and flour were exported without the benefit of any subsidy. These shipments were almost all from the Pacific coast. The export-subsidy operations of the last few years have reduced the quantity of wheat carried over under the loan program.

Practically all wheat-producing countries are attempting to support prices to their wheat growers through governmental action. This fact, coupled with our own wheat-price-supporting program, indicates it will be necessary to continue the export subsidies, unless our production declines greatly or we allow the surpluses to mount higher and higher or there is a change in our farm program. It is possible that an international wheat agreement will be concluded that will raise world prices well above the present level. In that event the subsidy rates can be

reduced. There seems, however, to be small prospect under present conditions that world prices will climb up to our high domestic level, and consequently small prospect that we can dispense entirely with the subsidy principle.

## SUGAR SUPPLIES FOR AMERICAN CONSUMERS

The past year tested severely the adaptability of the sugar program to present emergency needs. After the depressed sugar market which prevailed during most of 1940, there developed this year a sharp and unexpected increase in the consumer demand for sugar. Another problem which had to be met was that created for certain Latin American sugar-exporting countries, which normally receive only a negligible share of the United States market, by the virtual closing of their European sugar markets by World War II.

Some of the sharp increase in domestic-sugar demand this year was the result of heavier consumption brought about by the general rise in consumer buying power, but much of it reflected a widespread desire on the part of consumers to carry larger reserve stocks during the present emergency. There was a steady rise in domestic sugar prices during most of the year.

The increased demand manifested itself notably in the first quarter of the year and again in the third quarter. Ever-Normal Granary supplies of sugar were available to meet it. Large surpluses from domestic areas, especially Puerto Rico and the continental beet area, and from foreign areas such as Cuba and certain other Latin American countries, made the largest supplies on record available to American consumers.

The large quantities of reserve sugar were made available to consumers through a series of increases in the sugar-marketing quotas. Though the amount of sugar available to consumers was thus greatly enlarged, sugar prices continued to advance. Speculative disturbances in the sugar market, associated with the price rise in the latter part of July and the early part of August, led to action by the Office of Price Administration, which on August 12 announced that it was placing a ceiling on the price of raw sugar. This ceiling of 3.5 cents per pound on raw sugar was put in effect, the announcement stated, "to protect the American public from rampant speculation in sugar which has been pushing prices far above levels justified by large supplies on hand."

It was expected that because of ocean-transport difficulties the Philippines would fall short of filing their quota for 1941 and subsequent years. Consequently legislation was introduced in both houses of Congress to reallot most or all of the deficit among domestic sugar-producing areas. Asked to comment on the bills (S. 937 and H. R. 3582), the Department said it could not recommend them. It drew attention to the fact that one of the purposes of the Sugar Act is to protect our export trade. The Department added that under present conditions the need to encourage our foreign trade, and particularly our inter-American trade, is greater than ever. It is, of course, a truism that export and import trade tend to increase or decline together.

The Department also pointed out in its report on the proposed sugar-reallotment bills that, while the Philippine deficiency is pro-

rated in the first instance among all full-duty-paying countries that have quotas under the Sugar Act, it is finally reallocated to a relatively small number of countries. Chief among these are Peru and the Dominican Republic, two countries with which our trade has improved substantially in recent years.

During 1941 a substantial portion of the Phippine quota, and also of the unfilled quotas of foreign full-duty-paying countries, were reallocated to Peru, the Dominican Republic, and Haiti. These countries had suffered a curtailment of their European sugar market owing to the war. The United States helped them considerably by taking some of their unsold sugar. Our ability to aid these small nations in handling a difficult problem undoubtedly strengthened our ties with them and contributed also to Hemisphere unity in defense.

In the period of World War I the Government of the United States took control of the sugar industry for the protection of consumers. It takes time, however, to develop satisfactory methods for the control of an industry as complicated as the sugar industry. When World War I ended, the control system was still relatively crude. Nevertheless many of the necessary elements had been worked out. They have been in effect, with modifications, under the sugar-quota legislation of recent years.

Broadly, this legislation provides for division of the United States sugar market among the various domestic and foreign areas that supply it. The legislation requires complete control over sugar imports; provides incentives to domestic sugar production; and authorizes some control over the distribution of returns among growers, processors, and laborers. As a means of operating the control system effectively, the Government has valuable current data on sugar processings and on the deliveries and stocks of refineries, processors, importers, manufacturers, wholesalers, and retailers. Data of this kind were not available when we entered World War I, and had to be gathered.

The income of the domestic industry was maintained at approximate parity levels during the past year, the seventh since the sugar quota system started. The quoted wholesale price of refined cane, sugar, seaboard basis, averaged $4.62 per 100 pounds for the 12 months ended August 31, 1941, as compared with $4.61 for the year preceding, and with an average of $4.50 for the first 2 years of the operation of the Sugar Act of 1937. These figures include the excise tax of 53.5 cents per hundredweight of refined sugar. Conditional payments at the basic rate of 64.2 cents per hundredweight are made to producers out of the Treasury.

## WARTIME CHANGES IN THE TOBACCO SITUATION

Extension of existing Federal programs, coupled with new legislation, brought about some important developments in the tobacco situation. In the first place the Commodity Credit Corporation broadened its loan and purchase operations, and offered loans to tobacco producers at 85 percent of parity in line with a Congressional mandate. Second, additional types of tobacco came under the Agricultural Adjustment Administration marketing-quota provisions. Third, an amendment to the Agricultural Adjustment Act of 1938 changed the

base period used to establish the parity price for flue-cured and burley tobacco from the 10 years 1919–29 to the 5 years 1934–38. This change reflected adjustments growers had made to meet demands of the expanding cigarette industry and resulted in increasing the parity level for these two kinds of tobacco by about one-fourth. Fourth, another amendment to the same Act separated the dark types of tobacco into fire-cured, dark air-cured, and sun-cured, in a differentiation which had become important because of the different effects produced on the several types by the closing of export outlets. Fifth, the Agricultural Marketing Service provided an increased coverage of tobacco areas by its inspection and market news services.

Tobacco has been a principal cash crop in the United States since early colonial days, and about one-eighth of the Nation's farms now produce it.

Growers in 1940 offered a total of 276 million pounds of flue-cured, burley, and dark types as security for Government loans. Through a purchase and loan program similar to that of the previous year, the Commodity Credit Corporation took about 200 million pounds of flue-cured tobacco. In addition it facilitated the handling of 50 million pounds of fire-cured and dark air-cured under a dealer loan and purchase program and through loans to farmers' cooperative associations. In the latter part of the 1940–41 marketing season it placed approximately 26 million pounds of burley leaf under loan through a farmers' cooperative. These operations financed the storage in this country of a large proportion of the leaf that in a normal season would have been exported.

Under legislation passed in May, loan offers to producers of all types of tobacco became mandatory under specified conditions at 85 percent of parity. Only producers who cooperate in the AAA marketing quota regulations are entitled to loans at the full rate; but noncooperating producers can get loans at 60 percent of the full rate on their excess tobacco.

Producers of nearly 90 percent of all United States tobacco (flue-cured, burley, fire-cured, and dark air-cured types) approved marketing quotas for the 1941, 1942, and 1943 crops by majorities that substantially exceeded the required two-thirds. The referenda offered growers the choice of rejecting quotas altogether, adopting them only for the 1941 crop, and adopting them for the three years. More than four-fifths of the votes cast favored the 3-year plan. The closing of export outlets was an important factor in making the use of quotas necessary. In the period just prior to the present war, about half of our flue-cured, fire-cured, and dark air-cured production was exported. Since most of these exports went to England and continental Europe, in the year ended June 30, 1941, they had dropped to about half the pre-war level. Hope of moderate early improvement rests chiefly on the fact that stocks of the United Kingdom, which are nearly exhausted, may be replenished through lend-lease channels if sufficient ocean tonnage can be made available.

In the domestic market the trend continues upward in the consumption of cigarette types—flue-cured, burley, and Maryland. Cigarette consumption this year attained a new high record, and cigar and pipe-tobacco consumption also increased. Consumption of chewing tobacco and of snuff, which represent about 15 percent of the domestic

volume of tobacco products, showed no advance. There is no prospect that the domestic increase in tobacco consumption will offset the loss of exports, and maintenance of favorable conditions for producers requires the continued use of acreage allotments and marketing quotas.

Broadly, with the use of these features supplemented by the loan program, and in spite of export difficulties, the tobacco situation is favorable. The return to growers from prices plus Government payments should approximate full parity this year. In 1940 the returns equaled only about 80 percent of parity.

### Tobacco Inspection at Auction Markets

Free and mandatory inspection of tobacco was provided on one-third of all auction tobacco markets of the United States during the fiscal year 1941. This inspection service, with its accompaniments of market news and farm demonstrations in the preparation of tobacco for markets, showed promise of solving several difficult problems pertaining to the sale of tobacco at auction. The number of grades into which a given type may fall frequently reaches 100; and market values may range from 1 to 50 or more cents per pound, depending upon the grade. Lacking both the ability of judging tobacco discriminately and the means of summarizing sales as they occur, the grower has always been at a decided disadvantage. He has had no measuring stick by which to determine quality and no criteria by which to judge whether or not he was getting a fair price for his crop.

In recent years the inspection service has been used in the maintenance of minimum prices in some districts where, backed by Government financing, cooperative associations have established minimum selling prices according to grades. Practically all fire-cured and dark air-cured tobacco is marketed under these conditions and during the fiscal year 1941 a portion of the burley crop was so handled.

In January 1941, during the marketing of the 1940 burley crop, prices turned downward to a degree that aroused a widespread demand among growers that something be done to strengthen the market. Measures were adopted by the Commodity Credit Corporation, acting in cooperation with the Burley Tobacco Growers Cooperative Association, whereby minimum selling prices were adopted. Manifestly, these increases could not be given effective application except at markets served by tobacco inspectors.

As a result, tobacco was withdrawn from uninspected markets and carried to the inspected markets to such an extent that it threatened the closing of some of the former. At the same time, there was danger of swamping the markets at which tobacco inspectors were located. This shifting between markets produced so much confusion that all marketing operations were stopped temporarily. Through the employment of a few additional inspectors and a wider distribution of those already available, it was possible to supply total or partial inspection service on 10 additional markets and to resume selling. From this experience came the widespread demand that all markets in the burley tobacco district be designated for Federal inspection.

During the 1940–41 season, 568,152,774 pounds of tobacco was Federally inspected, compared with 522,710,889 pounds inspected in the 1939–40 season. These totals represent all types.

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## FRUITS AND VEGETABLES

The fruit industry as a whole has not suffered greatly from the closing of export outlets. In the past the United States has exported only about 11 percent of its fruit production. If only 11 percent of each variety had normally been exported, the loss of export outlets would not have been a severe blow to any one crop, especially with domestic consumer purchasing power increasing.

But the portion of the various fruit crops exported has varied from 2 percent in the case of cherries to 40 percent in the case of apricots and prunes. Exports in the past have represented 30 to 40 percent of the production of those fruits for which the principal market outlet is the dried fruit trade. For these crops the loss of European markets has been a severe blow.

In past years Europe took the major portion of our fruit exports. The United Kingdom was our biggest European customer. From 1934 to 1938 Europe took 95 percent of our canned-, 85 percent of our dried-, and 60 percent of our fresh-fruit exports. The United Kingdom alone took 85 percent of our canned-, 25 percent of our dried-, and 35 percent of our fresh-fruit exports. In the years just prior to the outbreak of hostilities in September 1939, however, import quotas and other trade restrictions had been in force in European countries. Immediately after this date the restrictions were made severer and wider.

Exports of fresh fruit from the United States were reduced to a mere dribble in a few months. Exports of canned and dried fruits decreased also, though gradually, until the spring of 1940 when the Scandinavian countries, the Netherlands, Belgium, and France were overrun by Germany. Since then our exports of canned and dried fruits, with the exception of raisins, have been practically negligible.

The effects were uneven among the different varieties of United States fruit, and uneven also among geographic areas. Loss of export outlets affected most of the fruits grown mainly for drying—the raisin varieties of grapes, prunes, and apricots. These fruits are dried mainly in California. Late pear producers in the Pacific Coast States, and apple producers in areas that formerly exported a large portion of the apple crop, have also run into difficulties from the loss of export outlets.

Dried fruit producers, growers of late pears, and certain groups of apple growers would have had serious problems if several compensating factors had not intervened. The pack and total supply of dried fruits in 1940 were smaller than a year earlier, but the unfavorable export situation made it advisable for the Government to act in the grower's behalf. This Department announced at the beginning of the season that the Surplus Marketing Administration would stand ready to purchase large quantities of dried fruits, particularly prunes and raisins, and that the Commodity Credit Corporation would provide loans on that portion of the pack which normally would have been exported.

As an aid to apple and late-pear growers, the Surplus Marketing Administration made large purchases of these fruits in a successful attempt to prevent prices from falling to unduly low levels as a result of the curtailment of export outlets. Increased consumer pur-

chasing power offset to a great extent the adverse effects of reduced exports. These dried and fresh fruits were also placed on the surplus list for distribution under the food-stamp plan.

Fruit supplies in the 1941–42 season are expected to be slightly to moderately larger than in the preceding season. Production of apples, peaches, prunes, apricots, strawberries, grapes, and California and Michigan plums will be greater than a year earlier. Production of pears, citrus, and cherries will be smaller. The effect of these increased supplies on fruit prices in general probably will be more than offset by increased demand for fruits and fruit products, and by Government price-supporting programs. Returns to growers generally will be larger than in 1940–41.

It is anticipated that exports to Great Britain will be increased somewhat this season under provisions of the Lend-Lease Act. These exports probably will be mainly dried fruits, and some barreled fruits to be used in the making of jams and marmalades. It is conceivable that Canada may reduce her imports of fruits from this country during the 1941–42 season. Fruit exports this season probably will be larger than last year, but they will continue to represent a small portion of the total fruit crop.

The war has had little direct effect upon the vegetable industry of the United States. Our foreign trade in vegetables in peacetime was of little importance and mostly confined to neighboring countries. Exports of dry edible beans have increased, both in the natural and the canned state, and of canned tomato products. There have been decreases in the exports of some canned vegetables such as asparagus and in the imports of canned tomato products. In relation to the total domestic use of these products, however, these shifts have been of minor significance except possibly the increase in exports of dry edible beans and canned tomatoes.

Indirectly, however, the war is having an important effect on the vegetable industry. The great upswing in consumer purchasing power in 1941 and the expectation that it will continue are resulting in an increased demand for all kinds of vegetables. In consequence prices and incomes received by producers are rising. The current season will be one of the most favorable for more than a decade.

Similarly, the Department encouraged an increase in the production of tomatoes for processing. Because of the lateness of the season, however, only a slight increase was obtained. Nevertheless, the pack of canned tomatoes is likely to be a new record high. Because of an increased domestic demand and an enlarged export movement, the supply is not expected to result in any surplus. Prices of canned tomatoes, together with those of other seasonally canned vegetables, have advanced. Despite the higher prices domestic consumption of all canned vegetables in the 1941 season probably will be considerably above that of recent years. It may reach a new high record.

## THE DEFENSE RESPONSE IN LIVESTOCK PRODUCTS

Outstanding among changes in the livestock and meat industry during 1941 was a great increase in the demand for meat and lard both for domestic consumption and for export to countries that are resisting aggression. The increase particularly affected the hog industry. For more than a decade previously hog producers had suffered

from a want of export outlets, which kept their prices low even in the domestic market. In other words, the weak export demand left them overexpanded in relation to the total call for hog products. Adoption of the Lend-Lease Act necessitated large purchases for export. As a result of this development and of the stimulus imparted by the defense program to the home demand, hog prices advanced and also the prices of other livestock and livestock products. Cash income received by farmers for meat animals in 1941 was about as large as that of 1929 and was one of the largest in the last 20 years.

Total marketings of livestock and meat products were about the same as the record 1940 production. There was a decrease in hog marketings which was about offset by an increase in cattle marketings. In 1942, both the marketings and the income from livestock may be larger. In fact, the year's meat supplies, if drought does not interfere, may be of record proportions. Marketings of both hogs and cattle are expected to be larger than this year's; marketing of sheep and lambs also may be moderately larger. The price level will probably be higher too. Further improvement in domestic-demand conditions, and additional Government purchases of pork and lard, will offset the influence of the expected rise in marketings.

It was evident when the National Defense Program was undertaken that consumer needs and consumer buying power for pork products would increase during 1941 and 1942. There was a possibility, on the other hand, that the supply of pork products would not increase. The pig crops of 1940 were below the record crop of 1939. Briefly, the outlook was for smaller marketings and considerable rise in hog prices. The Department brought this to the attention of farmers in conferences during the fall of 1940.

It seemed for a time that hog production would not increase quickly. The pig-crop report of December 1940 indicated a reduction in the number of sows expected to farrow in the spring. The Department urged farmers to maintain their hog production on a level at least as high as that of 1940. This appeal, along with the stronger demand situation, was apparently effective. The report of June 1941 recorded a spring pig crop about equal to that of 1940 instead of a crop 10 to 15 percent smaller, in line with the earlier indications.

In March, Congress passed the Lend-Lease Act. This measure enabled the Department of Agriculture to plan with representatives of the British Government for pork and lard exports in 1941 and 1942. On the basis of assurances that Great Britain would need large quantities of pork and lard from the United States, the Department announced a program to bring about an increase in hog production. The object was to provide a large additional supply for domestic use as well as for shipment abroad.

### The Government's Price Program

The program, which the Department announced on April 3, had three main features: (1) Government support of hog prices until June 30, 1943, at an average of not less than $9 per hundredweight, Chicago basis; (2) arrangements to make Government-owned corn from the Ever-Normal Granary available to livestock producers at prices calculated to stimulate livestock production; (3) encouragement to individual farmers to produce more feed for livestock pro-

duction, through an announcement that corn-marketing quotas would not become effective in 1941. Simultaneously, the Surplus Marketing Administration started making purchases to raise hog prices and to obtain supplies for export and for relief uses.

In the early period of the hog program the Department confined its purchases of pork chiefly to products from the heavier weight hogs. It did so to reduce the differential that existed then between the prices for light and for heavy hogs so that farmers would have an incentive to feed their hogs to heavier weights. The plan had the desired effect. Hog prices rose by the third week in May to the desired general average, with the prices of heavy hogs enhanced more than those of light hogs. In the spring and summer, purchases of pork and lard by the Government totaled approximately 300 million pounds. In this period hog prices ruled substantially above the announced $9 level.

## Beef Cattle Industry

There was expansion in beef cattle numbers in 1941. The period from 1934 to 1938 was one of liquidation, the result largely of the severe droughts of 1934 and 1936. Thereafter, the number of cattle and calves on farms increased. It was only about 2½ million head smaller on January 1 last than in the peak year of 1934. The increase was largest in the Eastern and Far Western States. In the Great Plain States cattle numbers are still well below the 1934 level. Widespread favorable range conditions and pastures this year encouraged an increase. Ranchers generally withheld breeding stock from the market. Cattle numbers for the country as a whole at the beginning of 1942 may be about up to 1934 peak. In fact, the upswing has reached a point now at which annual marketings of cattle and calves for slaughter can increase at the same time that herds are being built up further.

In 1941 the slaughter of cattle and calves was about 6 or 7 percent larger than that of 1940. The upward trend in cattle numbers may continue for 2 or 3 years, until it exceeds the 1934 level by a substantial margin. Within a few years marketings of cattle and calves for slaughter may be extremely large. In view of this the Department has urged farmers and ranchers to increase their marketings now as much as possible, particularly their marketings of aged cows and other she-stock. The next year or two, during which consumer demand is likely to be strong because of the defense program, may be a better time in which to sell than the succeeding period. Cattle prices advanced moderately in the last half of 1941. In the first half of the year, however, the prices of heavy, well-finished slaughter cattle declined, and the margin between the prices paid and the prices received for feeder cattle was in many instances unprofitable. Feeder-cattle prices were relatively high in the fall. Prices of fat cattle will have to average considerably higher in 1942 than they did in 1941 if cattle feeders are to make reasonable profits.

## Sheep and Wool

There was a further increase in sheep production. The lamb crop, about 5 percent larger than that of 1940, was the largest on record.

Marketings of sheep and lambs for slaughter exceeded the 1940 figures. Lamb prices averaged higher. Prices were higher also for wool from slaughtered lambs. In 1942 the marketings of sheep and lambs may be moderately larger, with improvement in consumer demand continuing to strengthen prices. Cash income from sheep and lambs in 1941 was the largest since 1929; it is likely to be still larger in 1942. The 1941 wool production was a record, with the shorn-wool output at nearly 400 million pounds. The increased production brought higher prices, and the cash income from wool to farmers and ranchers was the largest in more than 20 years.

Chiefly responsible for the rise in wool prices were the requirements of the United States Army. Total requirements for wool goods for all Government agencies in the year ended June 30, 1941, were 244 million pounds, grease basis. It is expected that in the year up to June 30, 1942, the Government will need 260 million pounds. Apparel wool used by manufacturers in 1941 probably exceeded 900 million pounds, the largest mill consumption on record. This quantity is about twice our own production of shorn and pulled wool. Our imports of apparel wool in 1941 were much larger than in any of the past 20 years.

## POULTRY AND EGGS FOR DEFENSE

In the poultry industry the production capacity is closer to our defense requirements than that of many other branches of agriculture. Many changes have taken place in poultry raising during the last 10 or 15 years. These changes, the general effect of which has been increased specialization, have laid a good basis for defense expansion. The growth of the commercial hatchery industry and the improvement in feeding and management practices have been largely responsible. Modern scientific methods have come widely into use among poultry producers in general-farming areas as well as in the most specialized poultry regions. As a result, the poultry industry, both on specialized poultry farms and on general farms, is answering well to the emergency call.

One sign of its power to do so is the fact that the number of eggs produced annually per layer is about 10 percent larger now than it was in the late 1920's. Output per layer has increased for all months of the year; the increase is most pronounced for November and December. In these 2 months the output per layer is now almost 60 percent larger than it was in the period 1926–30. This gain is the result largely of increased efficiency in poultry breeding and management. Along with the increase in the output per layer has gone a decline in the the average cost of producing eggs. This average in recent years has been some 20 percent below that of the late 1920's. It is a fortunate development because the average price received by farmers for eggs in recent years has likewise been about one-fourth lower than that of the 1926–30 period. It should be noted, however, that lower feed costs as well as increased efficiency have been a factor in reducing the egg-production cost.

New and improved methods of poultry raising have become general. In the late 1920's, for example, farmers purchased and custom-hatched only about one-third of the chicks they raised. Now they purchase and custom-hatch nearly three-fourths or more. Since hatcherymen

usually select desirable breeding stock this development has improved the quality of laying flocks. The Department has helped with technical advice and through its cooperation in the National Poultry Improvement Plan. The average quality of chickens produced by the hatchery industry today is notably higher than it was 20 or even 10 years ago. In fact, the widespread use of hatchery chicks has been perhaps the most important single factor in improving the average quality of laying birds in this country. More egg production per hen has cut down the number of hens required for normal egg production and has tended to limit the supply of poultry meat. It has an offset, however, in the tremendous increase that has taken place recently in production of commercial broilers and turkeys.

As a matter of fact, the total production of poultry meat in the United States has been relatively stable since the middle 1920's. The commercial-broiler industry has had a phenomenal development. It began during the late 1920's in the peninsula portion of Delaware, Maryland, and Virginia, the region known to poultrymen as the Del-Mar-Va area. In recent years other areas have entered the broiler industry also. Tentative estimates place the 1941 output at 150 million birds or more. Many of the chickens in this category now, however, are fryers or light roasters rather than broilers; a considerable portion weigh 3 pounds or more each. Turkey numbers in the United States, after dropping to a low point in 1927 largely from the ravages of blackhead disease, began increasing rapidly in the late 1930's. Means for controlling blackhead have been put into practice, and modern incubation and management enable producers to raise several thousand birds in single flocks. Turkey production in 1940 was about 33 million birds—more than twice the production in 1930. Production in 1941 will be slightly larger than in 1940.

Our food-for-defense program requires more poultry meat as well as more egg production. Lend-lease requirements are chiefly for eggs in dried, frozen, and shell form. Yet an increase is desirable also in the production of poultry meat mainly to supply an increased domestic consumer demand. Poultry meat has a defense value also in that it can replace other meats to some extent in domestic uses and make a larger quantity of them available for export. Most other meats, especially pork, are better suited than poultry for lend-lease needs.

Early in 1941 the Department announced a long-time price-supporting program for chickens and eggs with the general object of encouraging considerable expansion in the production of eggs and chickens. The long-term prices announced were: 15 cents a pound for chickens and 22 cents a dozen for eggs (Chicago basis). These are not fixed prices. They are simply the general minimum which the Department announced its intention of maintaining until June 30, 1943, subject to seasonal variations and other short-time factors. Since the announcement, chicken prices have been well above the 15-cent level. Purchases of chickens to sustain their price have consequently not been necessary. The Government has made purchases of eggs, however, under the lend-lease authority and for the purpose of stimulating egg production. In the 5 months April–August it purchased the equivalent of nearly 4½ million cases of eggs (dried, frozen, and shell). In these months the prices received by farmers for eggs were about 50 percent higher than in the corresponding period of the previous year.

After the Department's announcement of its long-time price-supporting program, chick production by hatcheries rose to the highest point on record. Farmers' purchases for laying flocks were heavy. The number of chicks and young chickens raised on farms in 1941 is indicated to be 14 percent greater than a year earlier. Farmers during the summer retained many more layers than usual. By early fall, the Department's goal for a 10 percent increase over a year earlier in the number of layers by January 1942 was practically assured. Some idea of what this means can be gained from the fact that the largest previous year's increase in layers was 5.4 percent. This took place from January 1936 to January 1937.

### The Objective for 1942

In spite of the fact that the number of layers in the country in 1942 will be considerably below the high point reached in 1928, egg production in 1942 will be a record. It will reflect the recent increase in production capacity per hen and the much larger number of layers. The gain over 1941 may even exceed that of the previous year of record increase. That year was 1936, in which egg production increased 11 percent. Relatively high egg prices in 1942 may bring out unsuspected latent egg-producing capacity.

It should not be supposed that this prospect is one of overproduction in eggs. Indeed, our egg production on a per capita basis will not be equal to what it was in the late 1920's. After allowing for probable exports under the lend-lease program, it will provide about the same supply of eggs for domestic use as we had in 1940 or 1941. Our consumption of eggs per capita in 1940 was 311 compared with the record high of 342 in 1927, and a record low of 276 in 1935. There is room still for increased egg production and consumption in the United States.

## DAIRY PRODUCTION FOR DEFENSE AND LEND-LEASE SHIPMENT

The Department of Agriculture, through the Surplus Marketing Administration and the Federal Surplus Commodities Corporation, is purchasing dairy products requested by the British. Lend-lease funds have been set aside for the purpose. For the 15-month period that will end in June 1942, the Department expects to purchase 250 million pounds of American cheese, 15 million cases of evaporated milk, and 200 million pounds of dry skim milk.

This demand for export is a new call upon the dairy industry. Normally this country has very little foreign trade in dairy products. It uses practically all the dairy products it produces and a little more, since it imports some cheese. Total consumption of all dairy products in the United States on a milk-equivalent basis amounted to 838 pounds per capita in 1940, about 4 percent more than in the prosperity period of the late 1920's. Yet many of our people do not consume enough to keep them strong and well. Obviously, if we are to help the British and promote our own national defense through better nutrition, we need increased quantities of dairy products. Americans are working harder and they have more money to spend. They want and are going to be able to pay for more dairy products. This fact, coupled with

indications of the British needs for dairy products, laid the basis for determining the goal for 1942.

Our milk-production goal for 1942 is 125 billion pounds as compared with a production of about 111 billion pounds in 1940 and of about 117 billion pounds in 1941. This is a big order, but the Department is confident dairymen can fill it. The dairy industry is in an expanding phase. Dairymen have been increasing their herds since 1938, and the 26 million dairy cows on farms at the beginning of 1941 made the largest total in several years. Moreover, the number of dairy heifers was large in relation to the number of cows; also dairy farmers are saving a relatively large number of heifers this year to be added to milking herds. Hence a further increase in dairy herds is in prospect.

Under recent legislation, the prices of dairy products and other crops classified as nonbasic under the Agricultural Adjustment Act are to be supported at a minimum of 85 percent of parity whenever the Secretary of Agriculture decides that the production of them needs to be encouraged. Under this law the Secretary has issued a price proclamation with regard to eggs, evaporated milk, dry skim milk, cheese, and chickens for the year 1942. The law provides also that advance notice must be given when it is found necessary to decrease the production of any such commodities, so that farmers may have time to adjust their production downward.

## The Dairy Marketing Problem

Producing more milk is the first essential, but there is also a dairy-marketing problem. It turns on getting additional quantities of milk appropriately utilized. To supply the British with the quantities of American cheese they have requested, and at the same time to have the same amount for domestic consumers as we had last year, calls for a 33-percent increase in cheese production. In the production of evaporated milk the desired increase is 25 percent. In the production of dry skim milk for human consumption the increase wanted is about 60 percent. Getting a general or blanket increase in milk production is not the only thing necessary. There is need for a greater increase in some localities than in others.

More production of cheese, evaporated milk, and dry skim milk requires the delivery of additional amounts of whole milk to manufacturing plants. Meantime the domestic consumption of fluid milk, cream, and ice cream is increasing, and this means a greater demand for whole-milk deliveries. Also the demand for casein is increasing sharply and casein production requires more deliveries of whole milk to plants. Getting the farmers to deliver whole milk rather than cream to plants calls for special inducements.

Farmers who separate their milk on the farm usually feed the skim milk to hogs, chickens, or calves. If they are to shift from this practice to the delivery of whole milk, they must have a considerably higher price for butterfat in whole milk than the price they receive for butterfat in cream. Accordingly, the Surplus Marketing Administration is paying prices for milk powder that warrant relatively high skim-milk allowances—higher in fact than the feeding value of the skim milk on the farm. In getting increased quantities

of milk powder, the requirements of the dairy program compete with those of farm animals. Ordinarily this country produces a considerable volume of dry skim milk for use in animal feed. Much of this could meet human food requirements, if the necessary care were taken in the processing. One draw-back is the rapid rise in casein prices which has made casein relatively profitable compared with dry skim milk.

## Relative Prices of Products

In order to encourage the production of cheese and evaporated milk the Department in its purchase program has maintained the price of cheese and evaporated milk relatively high in relation to butter. As a result, many plants that make these products have obtained milk from outside their regular supply areas. Other organizations have put in facilities for making these products in new areas. These developments have aided the cheese and evaporated-milk program but the associated abnormal price relationships have caused some hardship. Creameries, for example, have lost patrons to cheese factories and condenseries, and found themselves obliged to reduce their output. The diversion of milk from one outlet to another creates problems that have not yet been fully solved.

For example, facilities for making cheese, evaporated milk, and dry skim milk are concentrated in certain areas. Eight States produce about three-fourths of our cheese and evaporated milk: Wisconsin, Illinois, Indiana, Ohio, Michigan, New York, California, and Oregon. This concentration of plant facilities makes it difficult to get marked increases in the production of all three products simultaneously.

It brings the whole problem of plant facilities into the foreground. If present plants could obtain enough milk to run 24 hours per day for 365 days per year, much more than the desired amount of cheese, evaporated milk, and dry skim milk could be produced. There are limits, however, to the distances that milk can be transported to manufacturing facilities. The question comes up as to whether or not efforts should be made to move the milk to present facilities or move facilities to the milk.

## The Broad Requirement

Briefly the situation calls on the dairy industry for: (1) Increased milk production; (2) a shift from the delivery of farm separated cream to the delivery of whole milk; (3) an increase in American-cheese production of about 33 percent; (4) an increase in production of evaporated milk of 25 percent; and (5) an increase in the production of dry skim milk for human consumption of about 60 percent. These jobs cannot be done by any one branch of the dairy industry by itself. Dairymen have their part in increasing the total production. Agencies that process and market dairy products have a job in producing the products needed most, as shown by the relative prices of the various products. This Department and other public agencies have responsibilities with regard to production goals, price policy, procurement for lend-lease export, and technical and other aid to dairymen and processors.

Fluid milk consumption has increased in many sections of the country since the defense program started. The expansion has been especially marked in areas where defense industries have not only given fuller employment to the local people but have attracted a large influx of workers and their families from other sections. Army camps have also greatly expanded fluid milk outlets in the localities where they have been located. The men in the armed forces have been furnished milk, and with the increase in civilian population that goes with the establishment of such camps, local consumption of milk has expanded rapidly. In some of these areas there have been some difficulties in getting the necessary volume of milk of the proper quality.

Along with the problems involved in supplying milk for manufacturing purposes, certain problems have had to be met in the marketing of fluid milk. Prices paid to farmers for milk sold in city markets have moved upward. Where Federal marketing agreement programs are in effect to regulate the handling of fluid milk, producer prices have had to be increased because of the higher value of milk for manufacturing purposes and because of rising production costs.

In midwestern areas where plants for manufacturing milk products are located, prices paid by these plants to milk producers have increased considerably because of the improved export and domestic demand for dairy products. These plants compete with nearby city markets for supplies of milk. Attracted by the higher prices for milk used for manufacturing purposes, dairy farmers who supply city markets have shifted some of their milk to the manufacturing outlets. Price increases provided for under the fluid milk marketing agreement programs have been designed to keep the price relationships between the city and manufacturing outlets in line, so that adequate supplies of milk for fluid consumption may continue.

In the eastern sections of the country, price increases granted for fluid milk markets have been necessitated to a larger extent by rising production costs. Dairy farmers have had to compete for labor with nearby defense industries and have had to pay higher wages. In some portions of the East, production costs have been increased by drought, which has sharply curtailed feed and hay supplies produced locally. Under the Agricultural Marketing Agreement Act of 1937, which is the legal authority for the milk-marketing-agreement programs, it has been possible to bring about these price adjustments in an orderly manner. The action taken has been based on facts brought out at public hearings in testimony and evidence presented by dairy farmers, consumers, and milk handlers. The marketing agreement programs have made it possible for all producers in the markets to obtain the full benefits of the price increases granted and at the same time to assure adequate fluid milk supplies.

## DAIRY RESEARCH IN THE DEFENSE EFFORT

The quickest way for dairy farmers to meet the demand for more milk, and also the safest way from the standpoint of their future economic position, is to feed their present number of cows heavier rather than to expand their herds unduly.

Dairymen know that more grain in the ration will increase milk production considerably, but heretofore they have had no way of determining the economic limit in the feeding of extra grain. Consequently, they have been more inclined to underfeed than to overfeed grain, with the result that the country's milk-producing facilities often have not been utilized as fully as possible.

Now, however, as a result of the 3-year feeding experiment completed this year by the Bureaus of Dairy Industry and Agricultural Economics, in cooperation with 10 State experiment stations, the Department is able to advise farmers how to determine the amount of grain to feed to get the highest milk production that will be profitable.

In analyzing over 400 yearly production records of cows fed varying amounts of grain, along with all the good quality hay and other roughage the cows would eat, the investigators found that with every increase in grain feeding there was an increase in milk production, although the response became progressively less. At the lowest level of grain feeding, the nutrients contained in an additional pound of grain produced over 1½ pounds more 4-percent milk, whereas at the highest level the same increase in feed produced only about ½ pound more milk. Diminishing profits therefore may begin at any level of feeding, depending on the relative price of the grain and the milk.

In general, the results indicate that when the price of 100 pounds of grain is the same as 100 pounds of 4-percent milk, it pays to feed grain in moderate amounts—that is, at the rate of 1 pound of grain for each 4 to 6 pounds of milk the cow is producing—provided the roughage is of good quality and is fed liberally. If milk is worth 50 percent more than an equal weight of grain it will pay to feed 1 pound of grain for each 2½ to 3 pounds of milk the cow is producing; and if the price of milk is more than 50 percent above the price of grain it will pay to feed grain even more liberally. On the other hand, if milk is worth only about 70 percent as much as an equal weight of grain, it will not pay to feed any grain whatever, assuming always the liberal feeding of good roughage.

Dairy farmers ordinarily discard a greater percentage of their cows every year because of breeding and calving troubles than for any other single reason. Cows that fail to get with calf promptly or to deliver a normal healthy calf are costly to keep in the herd, and they seem to be particularly susceptible to such troubles at the ages when they would be most profitable to keep.

In its experimental nutrition herd at Beltsville, the Bureau of Dairy Industry noted that breeding and calving troubles were particularly frequent among the cows that were fed exclusively on barn rations, and also that such troubles largely disappeared when the cows were put on pasture. Accordingly, the Bureau decided to determine whether or not pasture grass and other green roughages contain some magic substance that affects the cow's reproductive functions; and, if so, to learn the conditions under which such material could be used effectively.

Working with rabbits, the investigators soon discovered that juices extracted from young or immature plants of oats, corn, alfalfa, feterita, and Sudan grass contained a material with power to stimulate ovarian action. One liter of juice from the corn plant contained enough of this material to bring about ovulation in 290 rabbits.

This material, however, was active only upon intravenous injection; and although it might be of value in human therapy its value to grazing cattle seemed doubtful.

This year the Bureau's studies demonstrated the presence of a material in the juices of young oat and corn plants that is effective when fed by mouth. Both male and female rats showed precocious sexual development and activity when the juice was included in the ration. Young female rats reached the estrous stage 17 to 20 days earlier than litter mates that received none of the material. Even young nursing rats showed the effect of the material when it was included in the mother's ration.

Nothing is known of the chemical nature of these materials, but they undoubtedly account for some of the beneficial effects of pasture on the reproductive activities of cattle.

## Milk and Milk Product Studies

From among the 10 to 12 million heifer calves born each year in the dairy herds throughout the country, dairymen ordinarily select 5 or 6 million to keep for future milk cows. An ability to make the wisest selection when the calves are from 3 to 6 months of age would be of considerable economic value to all dairy farmers. It would save much of the time and expense now incurred by so many farmers in raising heifers that turn out to be unprofitable. Investigations by the Bureau of Dairy Industry indicate that it may be entirely possible within a short time for experienced or trained persons to detect the more promising heifers, and even to predict future producing ability, by judging their mammary development at 3 to 6 months of age and comparing the development with standards set up for heifers of different ages and breeds. In the Bureau's studies, the specialists have followed the changes in mammary development in hundreds of calves from birth to producing age and have attained noteworthy results. These results will provide a basis for setting up the necessary standards.

The problem of providing Army camps with a satisfactory milk supply has introduced many complications, especially when the camp is situated in a section in which dairying is undeveloped.

At Camp Forrest in Tennessee, where from 30 to 70 thousand troops are stationed, the local milk supply was considered inadequate both in quantity and quality, and it was at first believed necessary to bring in milk from adjoining States. The representative of the Bureau of Dairy Industry in Tennessee was requested by the State authorities to organize the farmers and provide facilities for producing the amount and quality of milk required by the Army specifications.

Within 90 days farm conditions were so improved that inspection requirements could be fully met. A plant was constructed in which as high as 42,000 half pints of Grade A pasteurized milk is bottled daily. Army authorities pronounce this milk supply equal to that received at any camp in the country.

In the movement to reinforce bread with essential vitamins, riboflavin (vitamin $B_2$) was omitted because of its excessive cost. Investigations by the Bureau of Dairy Industry indicate, however, that

there is a good prospect of being able to obtain a supply of this vitamin from cheese whey at a reasonable cost. This valuable substance, which occurs in milk, remains in the whey when the milk is used for making cheese. The Bureau has perfected an entirely new method of separating the ingredients of whey, and the end product of the process is an intensely yellow milk sugar containing the riboflavin in pure form attached to sugar crystals. The crystalline material contains from 150 to 300 micrograms of riboflavin per gram and is suitable in every way for use in human foods or in medicine.

During the year, the Bureau of Dairy Industry developed a modification of the usual method of making evaporated milk, which, if it proves successful in commercial application, should enable processors to put 25 percent more milk solids in the standard can or case and thus save valuable shipping space as well as considerable quantities of tin for defense uses. Evaporated milk made by the usual procedure contains only about 26 percent of milk solids—the maximum concentration that will stand the high temperatures of sterilization without curdling. By the new procedure, the milk may be concentrated to a milk solids content of 32½ percent, without curdling in the heat of sterilization. The extent to which the milk may be concentrated depends on characteristics of the milk. Use of the new method in an evaporated milk plant would require only minor changes in the standard equipment.

With evaporated milk containing 32½ percent solids instead of the usual 26 percent, a standard case of 48 cans would contain 226 ounces of milk solids instead of the usual 181, or nearly 25 percent more actual nutritive value per case. The new procedure would result in a net saving of 1.68 pounds of tin per 100 cases, and a net saving of 20 percent in the number of cases, tin cans, and shipping space required.

The need for conserving our tin supply made it advisable this year for the Bureau of Dairy Industry to continue its research with lactic acid lacquers and resins, with the particular objective of perfecting a suitable protective coating for milk cans and other dairy utensils for which tin may no longer be available. Several processes for making lacquers and resins from lactic acid have already been developed and the products compare favorably with those made from such chemicals as phenol and formaldehyde, both of which are in great demand for other purposes.

A lacquer to be satisfactory for replacing the tin in milk cans must cover the metal completely with a thin, continuous coat, must have no action on the milk, must resist exposure to steam, hot water, alkaline washing powders, chlorine, weak acids, scratching, and denting, and should be bakable at a temperature below the melting point of the solder in the seams of the can. By modifying processes developed earlier, the investigators have so improved the lactic acid lacquers that they can be baked directly on iron without the use of a primer, forming a continuous impervious coating that is fairly resistant to destructive chemical and physical agents.

Since lactic acid is a cheap and abundant byproduct of the dairy industry every effort will be made to perfect resins and lacquers that can be used extensively to supplement other materials now used for protective coatings of various kinds.

## PRESSURE ON STORAGE FACILITIES

Will our storage facilities be adequate for the requirements of the National Defense Program and in addition for large stocks of agricultural commodities? Must additional warehouses be provided? No definite answer can be given as yet. The problem involves many factors about which insufficient data have been gathered. Among them are the unknown quantities of the defense program, which makes heavy demands for both storage space and transportation service.

Our defense preparations endeavor to anticipate emergencies as well as to build up stocks for planned abnormal needs. It would be rash to ignore any contingency no matter how improbable. One precaution, though it may prove inadequate, includes the building up of large stock piles of strategic commodities.

For example, the storage of adequate stocks of foodstuffs in large-population areas is being provided. Ordinarily the food inventory in a metropolitan area is sufficient for only about 2 weeks. Any interruption to transportation would jeopardize the population. Fruits and vegetables are not stocked to any extent; the market for these depends on daily deliveries.

Another defense storage problem is the stocking of feeds in deficit feed-producing areas in the North Atlantic States and in Pacific Coast States. Many farmers in these areas have become so accustomed to the dependability and regularity of transportation service that the last feed is used even as the new supply arrives. A transportation interruption might cause a serious decline in the production of essential foods. A handicap to some of these farmers is not only a lack of storage on the farm, but also difficulty in financing the stock of feed. Programs have now been made available to these farmers for adding reserve-feed inventories. This action will encourage the storage of feed stocks on or near the farms where they will be available in case of emergencies. It has relieved commercial storage for feeds.

The lend-lease program of food and munitions causes storage problems. Foodstuffs purchased under the Lend-Lease Act require storage space. They have to be concentrated at certain shipping points. Moreover, the foodstuff supply at these ports has to be kept large for emergency shipping requirements. Whatever interrupts the shipping service to lend-lease countries increases the warehousing load. Also war materials may be accumulated at these same ports for shipment. With a few exceptions the stock pile of war materials is considered of more importance than that of some of the foodstuffs. As the pile accumulates, storage priorities may be introduced at some locations. Various other storage problems arise in connection with the accumulation of a Federal stock pile of strategic materials, many of which have to be imported. The production of war materials also requires a large amount of storage for goods in finished and semifinished form.

Many agricultural commodities have been produced and stored during the past few years under the Ever-Normal Granary and crop-loan programs. Stocks of cotton in July 1941 were 1½ times as large as the average of the 10 years, 1931–40, and over 4 times as great as the average for the 10 years, 1921–30; stocks of wheat were 1⅓ times as large as the 10-year average, 1931–40; and stocks of corn were 2 times as large as the 10-year average.

## Storage Problems Very Numerous

Many problems of agricultural storage have arisen. What about the adequacy of the storage facilities? Where should the commodities be stored? How long will they have to be stored before they are likely to be needed? Are the stocks becoming too large to justify storing them and should production be decreased in the case of some commodities? The factors involved are so numerous and changeable that some of these questions do not admit of final answers.

There was a definite shortage of commercial grain-storage warehouses for handling the 1940 carry-over and 1941 production. Except for commodities requiring refrigerated warehousing, most other agricultural commodities do not present the same problem since they do not require such high-grade specialized storage. Of the grains, corn is mostly stored on farms where it will be used for feed. Wheat is moved into commercial warehouses on its way to the consuming public through flour mills.

Normally, the crop of the previous year gradually moves out of storage for consumption or export. By the time of the new crop harvest, storage facilities are again available for incoming grain. There was an estimated carry-over of about 387 million bushels of wheat, the largest on record, and an estimated new wheat crop of about 958 million bushels. Normal domestic consumption of wheat out of this supply will leave the largest prospective supply of wheat available for export and carry-over in the history of the country. It is the result of an above-normal crop and a limited export market. There is consequently a shortage of grain storage space.

Terminal-market storage facilities are of great importance. The bulk of the grain crop is shipped from the country to a relatively few important primary markets. Storage capacity for about 415 million bushels of grain is available for hire, in the 44 most important terminal and subterminal markets. About 145 to 250 million bushels are stored in these markets usually. Wheat accounts for about 65 percent of the grain stock; corn and oats account for about 10 percent each; and the other minor grains for the remaining 15 percent. Because of the holdings of the Commodity Credit Corporation, the proportion of corn in the total grain stored has increased in recent years.

In the spring of 1941 commercial grain stocks were at the highest level since 1929; they were 35 percent greater than the 10-year 1929–38 average, largely as a result of the increase in wheat and corn stocks. Ordinarily the percentage of the storage capacity utilized decreases slightly from October to January. In the 1940–41 marketing year the capacity utilized was 76 percent for both months. This was the highest figure on record for January.

Large stocks of grain are also stored in mills and mill elevators in the important commercial markets. On the average, depending on the season, from 60 to 130 million bushels of wheat are stored in such places, about 5 to 20 percent of the previous year's crop. In former years only 10 percent of the total stored wheat was not owned by the mills. In January last, the figure became 24 percent, the highest on record.

Grain is usually shipped directly from the farm to the country elevator or warehouse; thence it goes to subterminal and terminal markets.

Many country elevators and farmers also sell their grain directly to interior mills. Normally, in quantities that vary with the crops, from 25 to 130 million bushels of wheat are stored in interior mills, elevators, and warehouses. The figure last January was the highest in the 7 years of record; it was 70 percent higher than the 1934–38 average. Wheat stocks in interior storage have since reached new highs.

Grain normally moves out of storage between crops. This year in some areas the large carry-over hung back and left little space for the new crop. The Commodity Credit Corporation moved a large quantity of grain in order to make room for the new crop. There was threatened paralysis of the railroad transportation system during the harvest. Loading of grain in railway cars for certain markets had to be barred unless assurances could be given that space would be available for unloading the grain at its destination.

The effect was to force the holding of grain in storage at country elevators and on the farms. Experience with steel bins and other containers indicated that such storage was safe and satisfactory. It was encouraged through the Federal crop-loan program. The loan program enabled farmers to hold certain crops for a favorable market. It freed them from pressure to dump the supply at harvest time. Farmers can get Government loans either on crops placed in storage in approved warehouses or on grain stored in sealed bins on the farm.

Farm storage this year was encouraged through more favorable loan terms and relieves the congestion of the grain elevators. But the grain that has been held back closer to the producer may bring a problem next year. The usual consumer markets seem amply supplied. A large crop with no market outlet may upset storage and price conditions and bring about a serious situation for grain farmers.

## Conserving Transportation Resources

Transportation resources also are being conserved. World War I taught the necessity of centralized control, at least for each type of carrier; it seems to be the only way to get efficient operating use of equipment. The railroads have it through their voluntary association. In addition, the Interstate Commerce Commission has legal authority to enforce their cooperation. So far the railways have met the demands placed upon them, many of which were wholly unforeseen. Also in line with action taken in World War I, the railroads have provided a centralized control for all railroad port terminals to prevent congestion either with storage or with transportation.

Motor carriers have no effective organization for centralized contral. Nor does the Interstate Commerce Commission have authority to assume such control. The motor carrier system possesses unused transportation capacity, yet little effective use can be made of it under present conditions.

Ocean carriers were free until recently to seek the cargo most profitable to them regardless of the Government's need for stock piles of strategic materials. The result from a national point of view was very wasteful of ocean-carrier capacity. Now the Maritime Commis-

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sion may control the allocation of trade routes. By this means the country can more easily obtain imports of essential commodities.

### Special Surveys of Production and Equipment

Through its crop and livestock reporting service, the Department made the first comprehensive survey of grain storage capacity and stocks of grain off farms ever undertaken. The survey covered every State and took into consideration all establishments for storing wheat, corn, oats, barley, rye, rice, flaxseed, soybeans, dry beans, and grain sorghums. This survey assisted defense agencies that are working on the storage and shipping problems, and simplified and expedited handling of the 1941 crop.

As a further aid in meeting the grain storage situation, special midmonth reports were issued during June, July, and August on the probable production of winter wheat in the major producing areas. They gave data by crop reporting districts in Texas, Oklahoma, Kansas, Colorado, Nebraska, Missouri, Illinois, Indiana, and Ohio. For the spring wheat areas, midmonth reports also were made from South Dakota, North Dakota, Montana, and Minnesota. For the first time, a midmonth report was issued on corn in August 1941.

At the request of the Transportation Division of the National Defense Advisory Commission, a special survey was made of the capacity and facilities of all cold storage warehouses in the nation. Reports were obtained for more than 1,800 plant building units. On the basis of the almost complete coverage, it was indicated that the gross space in all cold-storage warehouses and meat-packing establishments, as of June 16, totaled 764,646,000 cubic feet. This is a net expansion of 221 million gross cubic feet since 1921 and an increase of over 18 million cubic feet since the biennial survey October 1, 1939.

With imports of many types of vegetable seeds curtailed by the war, rumors of seed shortages late in 1940 threatened to disturb prices out of all proportion to the actual situation. To obtain detailed information, the National Defense Advisory Commission requested a complete survey of vegetable seed production and stocks in the United States—first of its kind in 21 years. A report issued in January undoubtedly did much to allay fears of shortages. A second report, in April, indicated a harvest in 1941 of more vegetable seeds of nearly all kinds than in the previous year.

## LEND-LEASE BUYING AND SURPLUS DISTRIBUTION

The agency responsible in this Department for carrying out the food-buying part of the lend-lease program is the Surplus Marketing Administration. When the Lend-Lease Bill was before Congress, the implications for agriculture had to be considered. It became apparent that quick action would be necessary to lay the ground work for operations under the measure. Several problems stood out. It was recognized that each buying operation would need to be conducted with speed and efficiency and with the least possible disturbance of normal marketing. How to carry on the purchasing of agricultural products so as to bring the greatest benefit to farmers was another problem. Also prominent was the fact that the antici-

pated export need for farm products would have to be taken care of in addition to rapidly increasing domestic demands. The problem was to coordinate the purchasing operations with planning for adequate production. The food-for-defense program, announced within a month after enactment of the Lend-Lease Act and within a week after approval of the measure, was the answer.

Lend-lease funds could not be used immediately in the procedure in making purchases of agricultural commodities. First, specific requisitions for export supplies had to be received. Purchases had to be made, the commodities shipped to the docks, and the entire transaction audited, before lend-lease funds could be released for the payment. There was also the problem of knowing what commodities would be required, when they would be needed, and in what quantities. Limitations on ocean shipping and shipping space added to the difficulty of solving it.

It was obvious that flexibility would be necessary in carrying out the purchase operations. Time was an important factor, since farmers were in the course of planning their production for the season. A delay of a few weeks during the spring planting and breeding season would mean the loss of a full production year. Moreover, unless the buying machinery could be put into gear immediately, farmers stood to lose much of the benefit. This was particularly true in the case of dairy and poultry farmers, who were entering the peak months of their production year.

Experience and methods for carrying out the program were available in the Department of Agriculture. An organization for making extensive purchases of agricultural commodities had been in existence since 1933. This unit, subsequently designated the Surplus Marketing Administration, had been buying surplus commodities for domestic relief distribution at the rate of around 100 million dollars a year. It was the logical machinery for procuring agricultural commodities under the terms of the Lend-Lease Act.

Since lend-lease money could not be made available in advance, the Surplus Marketing Administration made arrangements with the Commodity Credit Corporation for purchases of commodities needed under the lend-lease program. The Corporation allocated 90 million dollars for the purchase of reserve supplies of lend-lease materials for which the Corporation was to be reimbursed from lend-lease funds collected in payment for goods turned over for export. This arrangement paved the way for a flexible buying program.

### Anticipation of Needs

In anticipation of export needs, the Surplus Marketing Administration in conjunction with the Commodity Credit Corporation made large-scale purchases of foodstuffs at the very beginning, even before actual requisitions under the lend-lease authority had been issued. Had this not been done, the flush production of dairy products and eggs, for example, would have moved into storage at the usual seasonally low price level. The benefits from a market strengthened by later lend-lease purchases would have accrued to the handlers and speculators. The procedure gave farmers a direct incentive to plan

for increases in production at a time when they could plan effectively. The improvement in prices that resulted from immediate buying went to farmers and not speculators. It increased by hundreds of millions of dollars the total farm income.

With the purchase program under way, it was possible to meet lend-lease requests for many foodstuffs from supplies already bought. Advance buying had provided supplies of concentrated foods such as pork, evaporated milk, cheese, eggs, and other nutritively rich products, for which an export demand had been expected. The British Government's food mission facilitated planning of the buying operations. It helped the Surplus Marketing Administration anticipate food needs for shipment abroad and consequently to make the purchases in a more orderly fashion than would otherwise have been possible.

The Department has other outlets for foodstuffs it buys, in addition to the outlet opened by the Lend-Lease Act. Hence, it is in a position to operate the purchase program in such a way as to protect broad national interests. Commodities purchased can be used for domestic distribution to public-aid families; for use in free school lunches; to meet requirements of the Red Cross for shipment to war-refugee areas; or for release upon the market when this is desirable. If some particular commodity bought for export under the Lend-Lease Act proves not to be required for that purpose, it can be used, for example, in the school-lunch program. Thus the food-purchase program serves various objectives. Besides promoting the defense effort through aid to our friends abroad, it harmonizes with the nutrition campaign in the United States. It also handles the purchases in such a way as to strengthen the food-for-defense program and give farmers the maximum benefit possible.

While defense activities have increased employment and consumer buying power, there are still millions of persons who lack an adequate income and who cannot afford to buy the kinds and quantities of food that they need. Here the Department's various distribution programs continue to function. They make food available to those who need it most and at the same time provide farmers with a wider outlet for their products.

## Surplus Distribution for Relief

Purchase of surplus agricultural commodities for relief distribution and for use in the school-lunch program and operation of the food-stamp plan enable millions of men, women, and children to obtain health-building foods which otherwise they might lack.

In the fiscal year 1941 the Department purchased 2,800 million pounds of agricultural foodstuffs for distribution by State welfare agencies direct to public-aid families and for use in lunches for school children. Approximately 2,500 million pounds of the foodstuffs distributed went to some 6 or 7 million members of public-aid families to supplement their limited diets. The school-lunch program made use of over 344 million pounds. Lunches, made in whole or in part with these foods, were served during March, for example, to nearly 5 million children in more than 66,700 schools throughout the country.

This compares with lunches served to 2.4 million children in 35,000 schools during March 1940.

The food-stamp plan, now in its third year, has become the most important of our domestic food distribution programs. It moves additional food supplies to needy families through normal channels of trade. Started in Rochester, N. Y., in May 1939, the plan is now operating in areas which include more than 50 percent of the country's population.

At the beginning of July 1940, the food-stamp plan was operating in 82 areas with slightly more than 1½ million members of public-aid families participating. By the end of June 1941, the program was operating in 363 areas with nearly 4 million persons participating.

Participants receive free blue stamps which serve to increase their food-buying power by about 50 percent. These stamps are good at any local grocery store in exchange for designated foodstuffs and are redeemed through the United States Treasury. Participants must purchase orange stamps in addition so as to assure continuance of their regular expenditures for food. Hence, the buying power made available by the blue stamps results in an increase in food consumption. With 4 million persons participating, the blue-stamp expenditure for designated foods was at the rate of 10 million dollars a month.

Another program that helps to bridge the gap between farm production and consumer need enables relief families and undernourished children to get more fresh milk at prices within their reach. Under one phase of the program relief families may obtain milk at about 5 cents per quart; under another phase school children get it at a penny for a half pint.

Handlers who supply the milk receive a Federal indemnity payment which, with the selling price, enables them to pay for the milk and the necessary handling and distributing services. Producers who supply the milk to handlers receive a special price for the milk used in the program. This price is lower than that established for regular fluid-milk sales but higher than the price established for so-called "surplus" milk. The program utilizes milk supplies which otherwise would be used for manufacturing purposes, and producers receive an improved total return.

These ways of getting food to those who need it make our food production more useful in building national strength. They may be important to cushion the shock of post-war adjustment. Lack of this type of machinery cost us dearly in the depressions that followed World War I. During the present period of heavy employment and increased consumer buying power the distribution programs can be maintained at low cost. They will be ready in the event of any post-war emergency for use on an expanded basis if necessary.

The efforts to improve agricultural marketing conditions through cooperative action continue to be supported by marketing agreement programs authorized by the Agricultural Marketing Agreement Act of 1937. Programs operated under marketing agreements and orders are in effect for a wide range of commodities, including milk, various fruits and vegetables, and various specialty crops such as hops and walnuts.

## CROP INSURANCE

The past year was significant for the Federal Crop Insurance Corporation for two reasons: (1) It marked extension of the crop-insurance program to a second major commodity—cotton; and (2) for the third consecutive time the Department's insurance agency achieved another notable increase in participation in its wheat-insurance program.

Consistent improvements and refinements of the insurance plan for wheat, coupled with increase in contracts from 165,775 in 1939 to 360,589 in 1940 and to 421,113 in 1941, led to Congressional authority to extend crop insurance to cotton.

In the decision to broaden the Department's insurance program was the fact that there is a definite need for making available to the producers of one of our largest agricultural crops the same form of protection that has been offered wheat farmers for the last 3 years. Because in the past we have had cotton surpluses, it is not generally realized that cotton-crop losses cost growers an average of 460 million dollars annually. The economic and social impact is far reaching upon some 13 million people who depend directly on cotton. The Department is convinced that it can be alleviated to a great extent by crop insurance.

In formulating a cotton-crop-insurance program the Corporation has drawn on its experience in insuring wheat. In fact, this experience will be invaluable in operating and administering the cotton program. Certain broad policies have been decided upon for cotton; but much detailed planning and actuarial work remains to be done. The cotton-insurance plan will be carried to the field in the winter of 1941.

The Federal Crop Insurance Corporaion will protect cotton growers from loss caused by all unavoidable hazards, such as drought, flood, insects, and plant disease, as is the case under the wheat program. The amount of coverage offered cotton growers will be the same as that for wheat growers, namely, 75 percent or 50 percent of their average annual yields. Also, as in the wheat-insurance program, premium rates, based on past crop-loss history, either historical or appraised, or both, will be established for individual farms.

Several improvements that will be applied to the wheat program in 1942 for the first time will be incorporated also in the cotton plan. Among them is the requirement that a farmer insure all the farms in the county on which he has an interest in the crop and not pick and choose among them for crop-insurance purposes. In some areas it is rather frequent for a farmer to handle several pieces of land. This provision has developed from the Corporation's experience with its wheat program in 1941. It was found that permitting farmers to single out the farms that they wished to insure tended to make them insure the high- and not the low-risk farms. Under the new plan this tendency to select the various risks will be reduced considerably.

### The Season's Wheat Insurance

It is impossible as yet to give a complete report of the Corporation's 1941 business. Indications at the close of the last fiscal year were

that 1941 would be the first year in which premium collections might approximate indemnities paid. However, Texas suffered some early abandonment due to blowing, and rust took additional toll of its crop late in June. Rust in Oklahoma, floods in Kansas and Iowa, the severe freeze over the Southwest area during the Armistice Day storm, and a tornado in Kansas accounted for further crop losses. The full effect of these destructive forces cannot be fully appraised until all loss claims are adjusted.

As of June 30 the Corporation had received 17,137 indemnity claims representing 3,269,911 bushels of wheat. The average premium rate during 1941 was 33.9 bushels for an average insured production of 261 bushels. Premiums on the whole probably ranged from 2 percent of the insured production in low-risk areas to as high as 40 percent of the insured yield in the high-risk areas.

Another change in the 1942 wheat program, which also will be applicable to the cotton-insurance plan, is the commodity-note method of paying premiums. Formerly, insured farmers paid premiums in either the actual commodity or the cash equivalent. For 1942, a commodity note has been made a part of the application for insurance. Under this note the grower can pay his premium, either in the actual commodity or in the cash equivalent, on or before the date of maturity. He also has the option of having his premium deducted from his indemnity, if any; or if the note is unpaid upon maturity and he suffers no crop loss, the amount of the premium is deducted from the first payment he receives for participating in the Agricultural Adjustment Administration program.

When payment is made after the note matures, it is payable in the cash equivalent based on the current market price of the commodity on the date of maturity. The date of maturity will vary from State to State since such notes will come due at about harvest time or when the bulk of the indemnities are usually paid in each area. It is estimated that this plan will save the Corporation approximately a million dollars annually in handling and storage costs of grain under the wheat program alone.

Losses were paid on the 1941 crop with certificates of indemnity. This certificate-of-indemnity plan, inaugurated for the first time under the 1941 wheat-insurance program, will be the one means of receiving indemnity payments in 1942. The indemnified farmer could exchange this certificate for the cash equivalent from the Corporation; he could exchange it for a warehouse receipt if wheat was available; or he could turn it over to the Commodity Credit Corporation and obtain a loan on the amount of wheat represented by the certificate.

Operation of the crop-insurance program continued to assure some wheat income to insured farmers who suffered crop losses. It helped many growers to improve and maintain their farm plant, pay current expenses, provide for their families, and pay taxes, mortgage payments, and interest. It furnished them with another source of credit. A large number of crop-insurance contract holders took advantage of this new credit source by assigning their insurance contracts as security for loans to meet current needs in connection with their farming operations.

Administratively, the Corporation remained unchanged during the 1940–41 fiscal year. The Corporation, an agency of and within the

Department of Agriculture, is supervised by a board of directors, and directs policy making, administers funds, and operates the wheat reserve. County committees of the Agricultural Adjustment Administration continued in their capacity as writers of the insurance with the attendant duties of acreage measurement and adjustment of losses. These committees—farmers who were familiar with local practices, problems, and conditions—settled claims for losses in a fair and impartial manner and with a minimum of delay.

### New Actuarial Formula

From the actuarial standpoint the Corporation made one important change in its basic structure. It developed a formula based on historical average yields and rates which was applied to the actuarial data for insured farms. The purpose of this improvement was to maintain the proper relationship between yields and rates on each farm. Application of this formula functioned as expected; it did adjust rates in conformity with yields and maintained a proper balance.

The key-farm system, first placed in operation early in the 1940 program to improve the accuracy of appraisals, was continued. Also continued was the special-practice procedure, which enabled the Corporation to give special consideration to irrigation and summer-fallowing practices in connection with yields and rates. In line with its original plan the Corporation incorporated into the 1941 yield and rate structure the actual yield and loss experience of the 1939 crop year. Under the 1942 program the operating experience of the 1940 program will be incorporated into the rate structure.

## OUR CHANGING CROP MAP

During the past 10 years the agriculture of this country has been undergoing some of the sharpest and most widespread adjustments in its history. The need for change began at the close of World War I, when our agricultural industry became unbalanced, and it was later accentuated as foreign demands for widely grown staples disappeared. Exportable surpluses were no longer needed either to meet the trade demands of a growing Nation or to meet the unusual demands of war and reconstructions in Europe.

These circumstances were brought forcibly to our attention in the years following the trade collapse of the late 1920's. Since that time, 30 million farm people have been slowly shifting their resources away from the production of surplus crops, such as cotton, wheat, and tobacco, towards products that have become increasingly in demand to meet our domestic needs for highly nutritious foods, such as milk, eggs, meat, fruits, and vegetables. In this process, the farmers have also succeeded in retreating somewhat from farming practices that endanger soil resources, and have adopted many technological advances and developed a more rational place for agriculture in our national economy.

Widespread adjustments had taken place before 1940, but in that year the National Defense Program brought new urgency to the shifts. Increased demands both foreign and domestic were again asking agri-

culture to meet an emergency. For example, milk production, which had been increasing less than 2 percent a year, needed to be increased at five times that rate.

History alone will tell how well our farmers meet these new demands, but past performance gives us the confidence to say that the job will be done and done well. With few exceptions, measures to meet the emergency demands will fit nicely into the long-time patterns of agricultural adjustments. When war subsides, nearly all of our increased capacity for livestock production can be used to provide food for the large segment of our population that is still undernourished, and the shifts will have brought about better use of many acres that are now in cotton and wheat.

The adjustments of the past 10 years have varied widely because of differences in resources, available markets, and social patterns. The Northeast has rather easily continued its trend toward specialization in the production of certain foods for direct consumption in nearby markets, but the South in its shift from too much cotton and tobacco to more livestock has been faced with almost unsurmountable obstacles. In some areas new enterprises were easily fitted to the soil, but their adoption meant less employment for farm people. The severest droughts on record accentuated this and other problems, and thousands of land-loving folk were forced to migrate aimlessly.

In spite of the countless difficulties, agriculture has been steadily adjusting itself to the new situation. We are far better prepared to meet the emergency demands of today than we were in 1917. The nature and direction of these preparatory adjustments can best be shown by regions having broadly similar resources. Many interesting changes have also taken place in smaller areas too numerous to describe in this report.

## The Northeast

Northeastern agriculture has been changing constantly since Squanto put the first fish in a hill of maize for the Pilgrims. Now, the modern Squantos are urging farmers to maintain their soils and yields with lime and superphosphate, while researchers are selecting new and better grasses for northeastern pastures. At one time, farming in the region was extensive and greatly diversified, with many products designed only for home use. Nearly all the products now grown in the West once had their production centered in the East.

Today, the northeastern farmers have one-third of our consuming population at their doorsteps. Consequently, farming now concentrates on perishables and bulky products. In many areas, production is almost on a factory basis, for large quantities of feed shipped in from other areas are converted into milk, eggs, and poultry for city markets. The large industrial population has also been the reason for widespread recreational developments in agricultural areas and the use of many farms for residence only or for some kind of part-time farming. One feature of this relationship has been the inevitable increase of low-income farming whenever industrial employment falters.

Recent adjustments in northeastern agriculture have been modifications of a pattern that has evolved over a period of years. Conser-

vation programs of recent years have emphasized the shift. Reduced exports have had little effect on a farming designed to produce for local consumption, but changes in industrial activity have been felt quickly.

Since 1930, the number of sheep has decreased by 25 percent and, while there have been small increases in the production of beef cattle and hogs, the number of these animals too is well below the number on farms through the first 25 years of this century. The acreages of oats and barley have registered further decreases since 1930 and declines have occurred in other products of lesser importance. On the other hand, increases have taken place in the production of fluid milk, poultry products, and certain fruit and truck crops.

The farms in this area are becoming far more specialized, and most of the milk supplies now come from farms selling little but milk, and and an increasing percentage of the eggs and chickens produced comes from strictly poultry farms. Consequently, although the production of both eggs and milk increased from 1929 to 1939, the number of farms reporting cows milked was 6 percent less in 1939 than in 1929 and the number reporting chickens was 12 percent less.

In the next few years, domestic and lend-lease demands will stimulate further increases in the production of poultry, eggs, and milk. Hog production, largely for home use or near cities as a garbage-fed enterprise, will also increase under the defense program but probably never again will be a major enterprise. Feed production should increase, and a continued increase in the quality of hay is almost certain. Farm wood lots and recreational uses of land will gradually be integrated with agriculture in the Northeast, but this adjustment is unlikely to proceed very rapidly until after the war.

## Lake States

The Lake States have continued to take advantage of their natural advantages from milk production. Good pastures and hay land have been improved and mechanical developments fitted into an expansion program for milk and manufactured dairy products. Dairying has been keynoted, for other livestock shifts have been slight. From 1928 to 1938, this region accounted for 34 percent of the country's increase in butter production, 28 percent of the increase in cheese production, and 22 percent of the increase in evaporated milk production.

The production of feed in this region increased markedly in the period in the 1930's. The production of grain increased 4 percent during this period, and the production of hay increased practically one-third. Most of this increase in hay tonnage was in alfalfa hay, which has a higher nutritive value than other tame hays common to the region. Acreages of oats and barley have decreased slightly, while corn acreage has increased slightly.

The rather remarkable expansion in hay acreage has undoubtedly been due in part to the conservation program. However, the increase in alfalfa- and other legume-hay acreages has been under way for the past 20 years or more, and it is probable that the educational efforts of extension men and others have been a significant factor.

Here is the region from which the United States and Great Britain may expect an increased supply of cheese, butter, evaporated milk, eggs, and poultry meats in response to increased emergency demands.

## The South

Changing world conditions dominate all current questions related to southern agriculture. An area with one-half the farm people of this country has now lost about one-third of the outlet for its major commodity, cotton. Cotton is still king, but his realm is more limited, and beyond these limits lie the food and feed crops that have been all too slowly selling themselves to southern farmers.

Perennial legumes, improved pastures, and adaptable livestock are fairly recent developments that may bring a more diversified agriculture and a more stable income to the South. The greater production and consumption of livestock products and food crops, along with a wise allocation of the more limited cotton production, promises a more wholesome living for the 40 million people in the 13 Southern States. If to this can be added increased industrial employment for rural people who now work less because of the reductions in cotton and tobacco acreages, then we will not only be providing for better soil use but, what is more important, for the people who work the soil.

It is difficult to visualize the increases in production and the changes in the use of land that would be required to supply a minimum adequate diet for the South. Thirteen million additional acres of crops adapted to the South are needed to supply its urban and farm population with a minimum adequate diet. This amount is equivalent to more than half of the 1940 harvested acreage of cotton, or about 10 percent of the present crop acreage of the South.

The increase in pasture acreage would be even greater. Open and woodland pasture would need to be increased by about 13 million acres, or the carrying capacity of the present pastures would require substantial improvement. A part of the additional pasture land might well come from the 16 million acres of cropland that is now idle or fallow. Fuller development of livestock enterprises is dependent upon improvements in pastures and yields of feed crops in many areas of the South.

These needs point to great changes in land use—changes that are already evident in widespread shifts that have taken place in the past 10 years. From 1930 to 1940, the acreages of cotton, wheat, and tobacco—all export crops with failing markets—were reduced 20 million acres, an amount representing about one-fifth of the total cropland harvested in the 13 Southern States. Present stocks and production levels indicate the need for still further reductions.

In the Southeast, a pattern of small farm units and a large farm population familiar only with cotton and tobacco culture make the adjustment problem particularly difficult. Reducing acreages of surplus crops is not a complete solution; new enterprises must be established and new production techniques mastered. Lack of capital, poor leasing arrangements, marketing difficulties, and low grain and forage yields add to the difficulties.

A primary problem is that of changing to a less intensive type of agriculture and at the same time providing an opportunity for year-around employment for the people in this region. The solution may lie in off-farm employment, but people who are disadvantaged by production shifts cannot be ignored. For many years a large proportion of the operations connected with cotton production were carried

on by sharecroppers who remained on the farms the entire year. During the past decade, however, the number of sharecroppers has decreased while the number of wage hands has increased. These wage hands have constituted an important part of the migratory-labor problem which has been assuming more serious proportions.

Adjustments in the Southeast have been slow but encouraging, because a wide variety of alternatives, including the production of eggs, milk, pork, and beef, are being adopted. As yet, far too few of these alternatives have been fitted to small units.

The South Central States are also shifting to more extensive types of farming but may have less difficulty than the Southeast because larger farm units will create a less serious population-displacement problem. The average size farm in this region, in 1930, was practically double that in the Southeast, and between 1930 and 1940 the average size farm in the South Central Region increased by 33 acres. The reduction of slightly more than 3 percent in farm population in this region during the period served further to increase the per capita land resources.

During the past decade the number of milk cows in this area increased 15 percent, the number of all cattle 23, the number of sheep 59, and the number of hogs 44 percent. Additional feedstuffs to support such increases were obtained by a decrease of 26 percent in the numbers of horses and mules and by substantial increases in the acreages of corn, hay, and small grain.

It is a striking fact that adjustments already under way in the South reflect the wide differences in the natural resources of such areas as the Piedmont, lower Coastal Plains, the Delta, the High Plains of Texas, and the western hill areas of Oklahoma and Arkansas. These differences exist in the availability of alternatives and in the natural adaptability of the land to the production of cotton, wheat, or tobacco. If further reductions or changes in allotments must be made these natural advantages should probably be recognized and followed as closely as possible.

For the South as a whole, the future will find many more livestock as farmers explore the possibilities of perennial lespedeza, kudzu, and new varieties of soybeans and of livestock adapted to the area. Assistance from outside will probably be needed, but the outlook for eventual freedom from a one-crop system is brighter than at any time in recent years. The impetus of defense demands will speed these shifts.

## Corn Belt

While agricultural income in the Corn Belt has been fairly well maintained, and the problems of agriculture are perhaps not of the same magnitude as those of the South and of the Great Plains, a series of adjustments have occurred in the past 10 to 15 years as a result of decreased exports of pork, improved varieties of corn, technological innovations, and other factors. The impact of these changes on the people has been less noticeable in this region because of a relatively high level of farm living and because of increased off-farm employment resulting from midwestern industrial development.

Acreage shifts of a considerable magnitude have taken place during the past 10 to 15 years and, of course, particularly since 1933. In 1940, the acreage of corn in the Corn Belt was 8 million acres, or 22 percent below the 1928–32 average acreage. The acreage of small grains decreased about 25 percent during this period while the acreage of wheat remained about the same. On the other hand, the acreages of soybeans and of tame hay increased by 8.1 million acres. This increase may be compared with the decreases in the land in corn and small grains, totaling 12.3 million acres. A substantial portion of the difference is accounted for by increases in pasture.

Notwithstanding the decreases in the corn and small-grains acreages, the production of grain in the region in 1940 was about the same as the average for the period 1928–32, and the total feed production (grain and hay) was higher than the 1928–32 average. The introduction of hybrid corn, improved conservational and cultural practices, the shift to more legume hay, and the favorable weather of the last few years have been of considerable importance in accounting for the higher yields. The continued progress of mechanization in displacing horses on Corn Belt farms has made an additional supply of feed available for other uses.

The increase in grain-consuming animal units from the 1928–32 annual average to the 1940 number was 3 percent, which is comparable with the increase in total feed supply. These two products did not move together from year to year between these dates, however, as is indicated by the larger stocks of corn in 1940, although increases in pasture were also a contributing factor. In 1940, the number of hogs, milk cows, and cattle other than milk cows were 6, 8, and 32 percent, respectively, above the average numbers in 1928–32.

A rather striking shift has occurred in the location of hog production since the 1928–32 period. In the western Corn Belt (Iowa, Illinois, and Missouri) annual hog production in 1938–40 was the same as that in 1928–32, and accumulated stocks of corn amount to 54 percent of a normal crop. In the eastern Corn Belt (Indiana and Ohio), annual hog production in 1938–40 was 121 percent of the 1928–32 average, and stocks of corn amounted to only 4 percent of a normal crop.

The increase in legume hay, together with the adoption of many conservational measures in the region, has made a good beginning in the control of soil erosion and the conservation of fertility. In this region erosion is usually of a character that can be satisfactorily controlled by the use of proper cultural techniques and crop-rotation systems. A desirable long-time objective in conservation would be to increase the percentage of total feed supplies furnished by hay and pasture. This would not reduce total feed supplies but would make profitable some shifts from hogs to beef cattle, with a further expansion in dairying in some areas.

The Corn Belt is the region best equipped to supply greatly increased quantities of pork and other meats in response to any emergency needs that may develop.

### The Great Plains and Western Range Regions

The demands of the present emergency should not be permitted to destroy the real progress that has recently been made in the Great

Plains region. World War I demanded and received vast quantities of wheat from the Plains, and the patriotic effort of those years was cruelly repaid in dust and depression during the early 1930's. Large areas are now being returned to grass and to their natural use for grazing.

During the past decade, the Great Plains was in a constant state of adjustment. The Wheat Belt moved eastward as drought destroyed incomes from corn-hog enterprises in the eastern Plains and made it difficult to get a crop in the western dry lands. In the corn area of the Northern Plains corn acreage was reduced by 4.2 million acres, or 36 percent, from 1930 to 1940, while the acreage in wheat declined by less than 300,000 acres, or 10 percent. Wheat-acreage decreases have been much greater in the western Plains.

Further south, the decreases in all crop productions were much greater. Kansas alone had a greater decrease in wheat acreage from 1930 to 1940 than the combined decrease of North Dakota, South Dakota, Nebraska, Wyoming, and Montana.

Wheat acreage all over the Plains increased greatly from 1935 to 1938, when the peak acreage of the decade was reached. Since then mounting surpluses have necessitated reductions that by 1940 had amounted to 10 million acres. A national wheat acreage of 55 million acres may mean a further reduction of about 5 million acres in the Plains. This will leave the Plains some 15 million acres of land for which alternatives must be provided.

The most attractive alternative is to use this land for feed crops and livestock—an adjustment that has already taken place in many Plains areas.

The years of drought caused many people to move from the region during the middle to latter part of the 1930's, and the industrial expansion of the past 2 years has attracted others. Consequently the average size of farm is much larger than it was in 1930 (the average size of farm in the grass area of the Northern Plains was approximately 350 acres larger in 1940 than in 1930), with the result that the possibilities of supporting the population on the land by an extensive system of farming are much improved.

With continued favorable weather, some shifts back to corn should be expected in the eastern Plains. Grain sorghums, oats, and some other grains have already been adopted in many areas of the Plains so that, in general, the region is building a feed base for increased production of livestock. A return of the Plains to predrought levels of livestock production will increase national production of pork about 5 percent, butterfat 1 percent, and beef from 3 to 4 percent.

The danger in the adjustments under way in the western part of the Plains wheat areas and in the more strictly range areas is that the favorable price of livestock will result in an overstocking of the range. Not only will this not increase farm income but it may take years to repair the damage done to the pasture sod. A vigorous effort should be made to prevent such a happening.

Plans for the future should not be based on the relatively favorable current weather situation. Stocking of ranges to capacity at this time will mean that sufficient feed and water supplies will not be available to carry such numbers during years of normal weather. Even at the present time in parts of the range country it is reported that the number of animals is so high that total production will not be as

large as if the number were lower, and it is probable that calf crops will be smaller than would otherwise be the case.

Range land use has been more conservative and farsighted in recent years than ever before. Many ranges are making a come-back that should not be jeopardized by an overstocking that will only result in smaller calf crops and lower average weights of all animals sold. Adjustments in many areas have been in the direction of balancing cattle and sheep numbers with range and winter-feed resources (either dry land or irrigated). The goal in such balancing has not yet been reached and certainly should not be jeopardized by backwards steps toward overstocking.

## The West Coast

The principal agricultural problems on the West coast during much of the past decade are associated with decreases in the acreages of wheat and deciduous tree fruits. The problems have been increased by the movement of farmers and others from the drought areas. Available cropland will be gradually increased as new irrigation projects are finished and stump land is cleared, but these developments will probably not be of significance until about 1945, and even with a larger land base the question of a profitable market remains to be answered. Furthermore, in many areas, water and not land is the limiting factor.

The importance of wheat in the Pacific Northwest is indicated by the fact that even after acreage decreases from 1930 to 1935, the 1935–39 average acreage of wheat harvested accounted for 42 percent of the cropland. During the next few years the decreases in wheat acreage in parts of the region are expected to be more than offset by increases in other areas.

In the Palouse and much of the South Snake River areas there are several fairly promising alternatives to wheat production, and wheat acreage will probably remain about the same or decline slightly. Commercial-wheat supplies may be reduced as a result of the use of wheat as livestock feed, but increases are expected in the acreage and production of oats, barley, and forage, which will provide a large part of the feed necessary for the anticipated increase in the number of hogs, beef cattle, and dairy cattle.

On the other hand, in the Big Bend and other low-rainfall areas, the production of wheat offers one of the few profitable uses of land, and farm income would decline over the short run if the wheat acreage were further reduced. Wheat will probably be fed on the farms where produced if the numbers of livestock are increased.

It is doubtful whether prospective developments in the Pacific Northwest, over the next few years, will result in the establishment of stable systems of farming in areas where there are few alternatives to wheat production. A more desirable long-time program in these areas would involve a shift from wheat to grazing land. In the Pacific Southwest, increases in the acreages of specialty crops, such as flaxseed and beans, and of sugar beets and alfalfa in the irrigated areas are expected to accompany decreases in the acreage of wheat.

For some time, low returns from the production of fruit have left many fruit growers in financial distress. Prospects for the future

are dependent upon market outlets for these fruits, either at home or for export under the lend-lease program.

In the citrus areas of the Pacific Southwest, acreage has increased slightly during the past decade, representing a leveling-off following the much larger increases from 1920 to 1930, and during the next few years no changes in acreage seem likely.

Migration to the Pacific coast has created many problems other than the obvious temporary social disorganization. Part-time and subsistence farm units have sprung up all over the Northwest, and thousands of applicants await the opening of new irrigation projects. The orderly settlement of migrants in cut-over areas and in new irrigation developments is a challenge that so far has only been partly met. These adjustments of population are an outstanding problem that may be answered if a minimum of assistance can be rendered because of the simple courage of the people who are pioneering on our few last frontiers.

## PREPARING FOR THE IMPACT OF PEACE

Some Americans dread the impact of peace more than the impact of the war. Wartime prosperity, they fear, may turn into a bitter and prolonged depression. There is even some opposition to the expansion of industrial facilities for defense, on the ground that such expansion now will aggravate the post-emergency letdown. But no depression is inevitable. We are not fighting to preserve democracy only to bring about a condition of general want, misery, and despair. America can and must maintain its present prosperity in peace as well as war. Agriculture especially has a big stake in this problem.

Farm leaders have long recognized that it is necessary to relieve the pressure of population on the land. Our defense emergency program tends to do this. In some rural communities we now have too few people. This reduction of population pressure has had a two-fold effect: it has increased the total agricultural income, and it has reduced the number of persons among which this income must be divided. Farmers are in a better position now to meet cash outlays.

It will not be easy to maintain this gain. We must look into the future. We must define problems and devise solutions. We must draw plans and develop new administrative machinery. The transition from wartime to peacetime prosperity will impose heavy new duties on the Department of Agriculture, and will widen the scope of its collaboration with farmers and with the general public.

What will be necessary after the emergency depends considerably on what we do now. The National Defense Program may leave new maladjustments and new problems. It would be rash to assume that our handling of it will solve any of our important problems and will create no new ones. Many of our old problems undoubtedly will be with us when the war ends, perhaps with additional complications.

The defense emergency has put a stop to business as usual. It has called for new factories for which there may be no peacetime use whatever. It has moved workers into jobs that call for skills not needed in peacetime, and into boom areas that may eventually become ghost-town areas. Transforming part of our peacetime industry into wartime industry means that one day we shall have to change it back.

This will be a difficult problem in the transfer of manpower and machinery from one line of production to another. How many workers will still be required in the aircraft industry, or in shipbuilding, or in making guns and ammunition we do not know. But they will probably not equal the present force.

It will not be easy to shift the surplus over to peacetime work. We are piling up a good many people in areas where they cannot produce peacetime goods in competition with factories elsewhere. Thousands will go back to their home communities or to other metropolitan centers. Many factories that have been converted to defense production will require new machinery before they can turn out peacetime goods once more. The retooling will require months. Meantime, thousands of workers will have no jobs. This initial lag will be dangerous. It may develop into a depression. The automobile industry, for example, will undoubtedly require as much manpower when it resumes capacity production of automobiles as it now needs to handle defense needs. But the equipment used by automobile manufacturers to produce airplanes cannot be used to produce automobiles. Providing new auto equipment will take time. In this and other lines there will be urgent need for a well-planned, well-coordinated effort to transfer manpower and machines from emergency to peacetime production. The job will have to be done quickly; and on the other hand, defense production will have to be curtailed gradually in a timing synchronized with the conversion of plants to new uses.

### Prospect for Maintaining Factory Production

Fortunately, the prospect of maintaining industrial production at a high level immediately after the war is good. Europe will have to depend on the United States to replace the ruined factories and factory equipment of England, France, Holland, Poland, and Russia. Our task may include feeding liberated nations. There also will be investment opportunities for American capital in Europe, in the Orient, and in South America. More important still, our priorities will have left a backlog of consumer demand. Perhaps the United States will have a year or two of prosperity after World War II, just as it had after World War I.

This, however, will be temporary. When it ends, the United States will face the same problem that it has had to deal with during the recent depression; namely, how to maintain a sufficiently high level of production to keep its manpower employed.

Production goals might be set just as we set them now. Methods might be developed for disposing of surpluses, so as to avoid the liquidation of sound enterprises. The Federal Government could enlarge its program of needed public works, might also work out and administer a program designed to give every family a decent living. The standard of millions is low even during the period of defense activity. Thousands need such elementary goods as shoes, new clothing, and household furnishings. Programs could be set up under which Government subsidies, through some type of stamp plan, would enable merchants to sell such goods at prices within the reach of needy families. These and other methods should be planned in advance.

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Efforts must be made to develop the service structure of the country. Thousands of families live without adequate medical or dental care. Thousands require nursing; many in our democracy lack adequate educational facilities. Facilities for entertainment and opportunities for cultural activity need to be improved. There is almost unlimited room for the development of service facilities in this country. As yet we do not even begin to meet minimum requirements for enjoyable, healthy living.

## Many-Sided Farm Plan Indispensable

Planning for agriculture will depend largely on the program for maintaining industrial production and developing our service structure. How many people will have to earn a living from the soil we cannot foretell. Nevertheless, agricultural planning must proceed. We can look forward to maintaining and perhaps increasing somewhat the production of certain farm commodities. Besides feeding the people of Europe, the Nation will need to continue its nutrition program. The outlook for certain export crops, however, is not too good. No matter how the war ends there will doubtless continue to be problems with respect to wheat and cotton production. The outlook for tobacco is somewhat more favorable. Broadly, we may have to curtail the output of commodities that do not rank high from a nutritive point of view, and to increase the production of commodities of high nutritive value.

There will have to be many post-war regional adjustments in agriculture. Renewed efforts will have to be made to transfer farm families out of poor into better soil areas. Crop specialization in the southern and Great Plains areas will have to be modified. In the place of cotton and wheat, such areas must consider the possibilities of meat, dairy and poultry products, fruits, and vegetables.

The problem of the low-income farmer may become more serious. Mechanization of commercial farms handicaps him in producing for the market. The farm-security program may have to be broader and different in emphasis. Less attention to providing the rural poor with relief and more attention to programs for lessening or improving tenancy and for permanently rehabilitating low-income farms, may be desirable. Many cooperative organizations may have to be established to enable the poorer farmers to buy and use farm equipment together, to develop group marketing, to obtain better medical care, and to get other advantages. Renewed efforts may be necessary to improve the condition of year-round farm workers. Better transportation facilities and living quarters and greater security of income will be among the goals of public policy for migratory workers. Efforts to raise the economic level of the low-income farmer will advance more rapidly if accompanied by efforts to provide nonfarm opportunities for rural youth and for others who cannot make a decent living on the farm.

The present soil conservation, flood-protection, and forestry programs will have to be expanded. A rural public-works program would promote conservation and also relieve rural unemployment in the transition period. Such a program should not be simply a way of putting money into the hands of low-income groups. As such, it

might delay basic adjustments. Primarily, it should be a means of preserving the soil and other basic resources, through procedures that also provide jobs.

### The Foreign-Trade Phase

Our planning should look toward increased foreign trade for agriculture under a system of reciprocal trade agreements. The production of exports that require continuous and costly subsidies should eventually be curtailed. The production of goods in which our country can compete at world prices in export trade should be increased. We shall need a price and fiscal policy that will bring our system of evaluating farm goods into line with that of the other nations. Adjustment to that basis, however, will have to be gradual, and in line with current or prospective trade agreements.

In general we can expect post-war decreases in prices, wages, and cost of living. These need not cause any important change in the real income of the industrial worker. It will be necessary, however, to synchronize wage and price changes. In some industries, and for some agricultural commodities, there may be rapid decreases. The decline may result in renewed demands for Government subsidies and surplus disposal programs. Such aids will require the support of continued cooperative crop adjustment. Should prices and wages decline sharply, the debts of industrialists and farmers will be more burdensome. It is to be hoped they can be scaled down without chaos and strife such as followed the previous world war. Creditor and debtor will have to get together. There may be need for assistance by public agencies.

As long as the war continues our country will have to maintain an extremely large armed force. It may have to increase its emergency spending. Such a program will give the Nation relatively full employment. But a large part of the resulting production will not increase human happiness and welfare. It will consist not of shoes and clothing, automobiles and refrigerators, but of airplanes and guns. This is possible for a few years without great harm. Eventually, however, it will interfere with satisfying minimum essential needs, and even with proper maintenance of national resources. Emergency controls will have to be continued. More effective hemispheric programs will have to be developed, which may call for basic economic adjustments within the United States. Foreign markets will be inaccessible and foreign investment opportunities scanty. Manifestly, therefore, we have to go on in the path we are in and to make a single job of defense planning and post-war planning.

## AGRICULTURE IN POST-WAR READJUSTMENT

The Department visualizes a post-war world in which we will make full use of our manpower and our material resources for the benefit of the whole people. It believes that with wise and courageous action it will be possible to reach and maintain a national income greater than we have ever had before. The cooperation of leaders of agricul-

ture, and of farmers generally, will be important in making that ideal a reality. All agencies of the Federal Government are starting now to prepare plans and programs for post-war action to maintain high levels of production and employment after defense is over. The Secretary of Agriculture appointed an interbureau committee last spring to carry on agriculture's share of the work, in cooperation with other agencies both public and private that are working on the same problem.

The National Resources Planning Board has the responsibility of centralizing the post-defense planning. By Executive direction it is gathering, analyzing, and collating all plans for post-defense activities both public and private that have to do with natural and human resources. After a preliminary study the Board issued a publication entitled "After Defense—What?" in which it indicated the magnitude of the task, named some of the objectives, and described some of the requirements. The Board's primary function is to gather ideas and plans, to stimulate appropriate independent action by other public and private agencies, to bring together individuals who are interested in harmonizing their views, and to furnish information on these matters to the President and the Congress. It hopes in this way to systematize and give a collective general sense to the post-defense planning of individuals and of Federal, State, and local agencies.

By Executive Order No. 8455, and under the Employment Stabilization Act, the Board is developing 6-year programs of Federal public works. It receives such programs from this Department and other Federal agencies and combines them in the "shelf of projects" elsewhere discussed in this report. Along with this reservoir of public works, the board also considers advance programming of normal Federal works, with the object of weaving them into a general national plan. For example, there is the Public Works Reserve, a WPA project sponsored by the National Resources Planning Board and the Federal Works Agency. Its task is to develop a reservoir of public works under the sponsorship of the State governments and of political subdivisions within the States. This group of projects largely emphasizes programs for urban centers but includes also many in the rural field.

Yet the planning of public works, in the usual sense, is only part of the necessary post-defense planning. Indeed, the entire job goes beyond public activities and concerns the entire economy. Accordingly, the Federal Reserve Board, the Treasury, and the Bureau of the Budget have responsbilities with regard to it. These agencies are studying the financial and fiscal aspects. Other phases of the matter that concern Federal agencies include international relations, especially the proper kind of post-war settlement, industrial adjustments, and the conservation of human resources. In these fields the State Department, the Department of Commerce, and the Federal Security Agency are active. The Department of Agriculture has a large place in the total pattern of post-defense planning especially in connection with its cooperation with farmers for crop adjustment, soil conservation, and land use improvement. Other Federal agencies likewise have relations with nongovernmental groups whose cooperation will be necessary.

### Need for Coordinated Urban Planning

As yet there is no coordinated urban planning for private action. Various non-Government institutions and industrial groups are actively engaged, nevertheless, in preparing programs to help maintain employment in the post-defense period. Eventually they will have to collaborate. Some tendency for them to get together may develop spontaneously, through the parallel and interdependent character of their projects. There is scope here for the cooperation of Federal agencies. The National Resources Planning Board, for example, has to consider private as well as public planning in its surveys of feasible post-war operations, and its findings may influence the decisions of commercial and industrial enterprises. Ultimately, if the post-war job is to be done well, it will have to dovetail public with private action on a broad scale.

This Department's part in post-defense planning involves three different lines of inquiry: (1) Keeping in touch with developments that affect the economy as a whole; (2) the development of rural works programs in the capital-improvements field; and (3) the development of publicly sponsored programs of rural welfare. The first of these three categories is extremely important. The National Resources Planning Board envisages a post-defense program of full employment with the national income maintained at not less than 100 billion dollars a year. Attainment of it will require a large degree of cooperation by industry and Government. Shifting industry from a wartime to a peacetime basis is essentially a problem in developing sources of consumer buying power to take the place of defense expenditures. Related problems include the development of new uses for defense plants, and the establishment of new factories for new products. Without success in this general phase of the post-war job, progress will be difficult in the agricultural phases.

### Broad Public Participation Required

No group in Washington could by itself effectively develop the plans and the programs necessary. The job requires the understanding and participation of agriculture, industry, and labor, and of public agencies throughout the country. For that reason the Department's work on post-war programs will be carried out to a considerable extent in the field. Much of it will enlist the cooperation of State and county agricultural planning committees, which will help to develop specific projects in their States and counties both for public works and for public services. These committees will also consider various proposals for action in the national field which will be submitted to them for discussion and criticism. The Department hopes that with the participation of farm leaders throughout the country, this process will develop programs of the most practical type, which the people will be ready to support and carry out. Necessarily, the programs will be industrial as well as agricultural. Agencies of this Department will cooperate with other public and private agencies and also with industrial and labor leaders. To the extent that agriculture, labor, and industry collaborate in formulating post-war programs, we shall have assurance that the productive energy

developed during the war will be maintained at full tempo for the purposes of peace.

There will be a broad field for the restoration of agriculture's physical resources. It will include soil conservation, all aspects of forestry, water developments, flood control, and the opening of new lands. Many of these activities are under way already, but not on a scale commensurate with the need. The development of public facilities for rural people is a relatively neglected field. Farms in all parts of the country need electrification. Country roads need improvement. Publicly sponsored welfare programs and services may help the transition to a peacetime basis. Wide scope exists for the installation of quick-freezing plants, food-storage facilities, and other utilities. Apart from capital improvements there is vast need for rural welfare work, in such fields as living standards, education, medical care, food distribution and nutrition, modernization of farm equipment, the development of cooperatives, and farm tenure reform. Programs of rural housing, recreational facilities, rural hospitals, and sanitation are overdue.

It will be necessary to work out the roles of the Government and of industry in the post-war economy. Our part in Europe's rehabilitation will affect them. Few economists believe Europe will drop its trade controls at once. What happens abroad between governments and traders will affect what happens here. But this will depend greatly on the character of the peace settlements with respect to limitations on the exercise of sovereignty over economic affairs. All such developments will deeply concern agriculture, which more than any other branch of our economic life has an interest in relatively unimpeded internationl trade.

Full employment after the war would of course mean a larger domestic market for foodstuffs and perhaps some marked expansion also in the industrial uses of farm products and in the industrial demand for rural labor. There will be long-term trends to consider, notably in farm technology and in probable shifts in the demand for different farm products. Part of the immediate job for agriculture is to lay out a program of rural works that will serve the double purpose of providing employment and conserving resources. The second objective will always be important; the first, if industrial employment is maintained at high levels, may not be so imperative. In that event it need not be stressed.

## THE SHELF OF PROJECTS

The term "public works" popularly brings to mind massive construction of bridges, roads, dams, and public buildings. It means more than that. It covers much other tangible physical work that provides a flow of benefits, products, or services, and adds to the wealth or the productive capacity of the Nation. It includes hospitals, irrigation, reforestation, soil conservation, rural housing, water facilities, rural electrification, rural schools, market roads, and the like.

There is enough work to be done to justify a rural public works program. The job of protecting and building up the natural wealth of the Nation can always use our surplus manpower. There are

almost limitless possibilities on farm, range and forest land, and throughout our river systems. They should be tackled in the post-defense period, if that period proves to be one of low employment. Any future time of low employment will warrant drawing on the "shelf of projects."

In building such a shelf it seems necessary to weigh the relative social and economic worth of the many different proposals. Moreover, after separating the chaff from the wheat, we should grade the winnowed grain. This is difficult, because any program for dealing with national resources has many intangibles. Yet recent experience in conservation and public works provides a number of broad criteria.

Each proposed project should meet certain standards. It should contribute to over-all objectives such as public-works construction, conservation, human rehabilitation, and development of natural resources. It should relieve unemployment and increase economic activity. It should help people to get from the land all the benefit that is consistent with maintenance of that basic resource. Of course, it should be technically sound. Precise tests should establish priorities among different proposals.

## Costs and Benefits

One appraisal device used by this Department, notably in its flood-control work, is a dollars-and-cents comparison of the estimated costs with the probable benefits. Each project for the rural-works reservoir should be scrutinized carefully from the cost-benefit standpoint. Projects whose total costs exceed the expected benefits probably should not be undertaken. Projects with a high ratio of benefits to costs should generally receive a higher rating than those with less favorable ratios. Among projects with favorable cost-benefit ratios, preference should be given to those that will best aid needy groups.

Cost-benefit ratios should be considered with caution, and with a broad view of the purposes involved. For example, we should not confuse the question of total costs and total benefits with the question of who pays the bill. A favorable cost-benefit ratio in a project need not imply that there is no public subsidy in it whatsoever, or that all the project costs should be reimbursable. It is necessary to recognize intangible and broad social benefits in formulating projects and programs, as well as tangible and individual benefits.

For some benefits there are no commonly acceptable yardsticks. The recreational value of forests, parks, and lakes is real, but resists attempts at a precise evaluation. Benefits of soil conservation work in limited areas have been measured in terms of the dollar value of increased productivity; but it is difficult to measure them against the soil resources of the Nation, which are irreplaceable and priceless. Public purchase and development of submarginal land may not always be profitable from a strictly commercial point of view; but it may yield benefits in the larger sense of increased community stability and decreased costs for relief.

Where we cannot be exact in assigning a money value to expected benefits, we must achieve a reasonable uniformity of judgment; we must see that benefits both tangible and intangible are fully recognized

but not overvalued. We must not make fantastic guesses simply to justify a project.

All relevant costs must be recognized and weighed as accurately as possible. Social costs as well as strictly monetary expenditures should be included. Social costs occur less frequently than social benefits. But there may be cases where, for example, the displacement of people from reservoir sites or from land-purchase projects would involve more than the obvious personal and public monetary costs. What becomes of the displaced people, whether they prosper or fail in such new locations as they may find, bears significantly on the ultimate social costs of such undertakings.

## Deciding Who Should Pay

Once the costs and benefits have been determined, the question arises who should pay the bill? It seems equitable that costs should be apportioned generally on the same basis as that on which benefits accrue. To take a simple case, if half the benefits of a given project go directly to a particular group of landowners, and half to the general welfare, it would appear that these landowners might bear half of the costs and the Government might bear the other half.

But the term "general welfare" is elastic; it may have a different meaning under different conditions or in different times. In periods of high employment, the Government probably should assume only the cost of producing benefits that are widely distributed, that contribute to an important national policy, or that have been recognized as a Federal responsibility or function. On the other hand, when unemployment exists widely, the Federal contribution should cover additional parts of the cost, such as may reasonably be charged to unemployment relief. The Federal Government's contribution also should vary with the economic status of the people served by a particular project or activity. In short the ability of benefited persons to pay some of the cost should be taken into account.

It is important also to distinguish between the original advance of funds and the ultimate responsibility for paying the bill. Who is to pay in the long run is an essential consideration. All other considerations being equal, a project whose ultimate costs are borne in roughly the same proportion as the social and private benefits should rate higher than one that involves a proportionately heavier public contribution.

## Timing and Placing Projects

Each project should be examined within the framework of plans for the region where it would be undertaken, and within the larger framework of the national agricultural program. It should help to correct regional and national farm maladjustments. It should be capable of prompt modification to meet shifting needs. The current emphasis on dairy, poultry, and meat production aids defense and accords also with the long-range dietary needs of the American people. Probably, therefore, it will carry over into the post-defense period. If a flood-control project is proposed for the northern Great Plains, it should fit in with the Department's effort to change some areas

from cash grain to livestock and grass. Forestry projects should be consistent with broad regional needs and with Federal and State forest policies. It would be folly to plan public works that would encourage or even sustain the production of surplus crops in high-cost producing areas. That would be to work for the misuse of land.

Timing is important in rural public works. The volume should vary in some rough but predictable relationship to economic conditions and employment. Such timing would not rule out projects such as large reservoirs, which require advance preparations and which must be completed before any benefits can be realized. But long-range projects should be balanced in any region with undertakings of a more flexible character.

One possibility for public works in the post-defense period is development of new areas for agricultural settlement, and rehabilitation of existing areas. Much can be done through irrigation, water facilities, flood control, drainage of land, clearing of land, and land purchase, development, and resale. The Mississippi Delta, areas of the Northwest, the Plains, and the Lake States cut-over region, may be the scenes of such activities. Forestry offers vast opportunities. The contradiction of idle men and of relatively unproductive forest lands need not continue.

Western range land needs improvement. In many districts this is true of Federal, State, and privately owned lands. Rural housing is a problem for which no adequate public approach has yet been devised. Rural electrification is developing, but large potentialities for it still exist. Sanitation, health, and related activities present many opportunities. Such work should not be shunned merely because evaluation of it is difficult on a dollar and cents basis. In fact it is important in planning a rural works program to break with traditional conceptions, and to set new and broader standards.

## AGRICULTURAL PLANNING

Cooperative land use planning, or agricultural planning as it is now coming to be known, is a joint program of the Department of Agriculture and the State land-grant colleges. It has spread in less than 3 years to 47 States and to nearly two-thirds of our agricultural counties. Designed as a democratic means of unifying national, regional, and local farm interests and of coordinating public agricultural programs, agricultural planning has developed rapidly in the defense emergency. By democratic procedures, it promotes the full cooperation of farmers, agricultural experts, and administrators of farm programs in plans and policies to increase the contribution of agriculture to the defense of democracy and to promote rural well-being.

During the past year, State agricultural planning committees have been active in 47 States; county and community agricultural planning committees have been at work in nearly 1,900 counties in these States. More than 10,000 community committees have participated in the program. The State and county committees include farm men and women and representatives of Federal and State agencies, while the community committees are composed primarily of farm men and women. There are now more than 140,000 members of State, county,

and community committees. Some 122,000 are farm men and women and 18,000 are representatives of agencies of this Department, of cooperating Federal agencies, and of State and local governmental agencies.

Knowledge developed by agricultural planning committees during the first years of the planning program has served this year as a basis for plans to meet defense problems. The earlier work emphasized mapping of different land use areas—for example, rough, stony, or cut-over areas with small, impoverished farms, areas subject to erosion when in cultivated crops, forested or other unsettled areas, and areas with good land farmed in varying degrees of intensity. Along with the mapping agricultural planning committees studied the major land use problems of the areas, and worked out programs to mend matters. By the end of June 1941, 1,229 counties had either completed land mapping of this kind, or had the job well under way. This groundwork, which educated workers in the agricultural collegs, research agencies, and action programs, as well as farm people, has been of great value in the defense emergency. For example, it has shown where additional cropland is available and where more intensive cultivation is practicable and expedient. It has indicated areas of underemployed or unemployed farm people, so that such people may be approached readily with offers of jobs in areas where farm production needs to be maintained or increased. It has helped to prevent unwise expansion of cultivated acreage through indications that the wise use of land can meet all requirements fully. It has revealed how acreage can be shifted from crops not needed for defense, or from crops that we produce excessively, to the production of feeds, vegetables, and essential food crops.

### Committees Queried on Defense and Unity

In January 1941, the Department asked the State agricultural planning committees to indicate how agriculture could best contribute to national defense and national unity, how benefits from the National Defense Program could be utilized to bring about needed adjustments in farming, forestry, and rural living, and how unwise types of land utilization could be prevented. They responded with speed and efficiency. Working without pay, the farmer members of the State committees, in cooperation with agency representatives and technical experts in the State agricultural colleges and the Department of Agriculture, developed comprehensive programs which were submitted in reports to the Department of Agriculture within a period of less than 5 months.

Conferences were held in June in different parts of the country to summarize and coordinate the reports of the State committees. Salient features of the summary that resulted, which is being used as the basis of further development of the agricultural program, are reviewed later in this report. The State committees are continuing further to refine their plans.

In special areas, where defense industries or large military establishments have been located, agricultural planning has provided information on the availability of homes and farms for displaced farm families; it has furnished inventories of local labor available

for construction and industrial work; it has helped to place the location of housing for defense workers so that the construction will be of permanent value. Committees have worked out plans for making locally grown perishable farm products available at nearby Army training centers.

In Brown County, Tex., the agricultural planning committee developed plans for the organization of a farmers' cooperative to supply fresh, locally grown farm products to nearby Camp Bowie. The committee started work on this project in January 1941, and by June a building for the conduct of the business of the cooperative had bee constructed and was in use. In Barnstable County, Mass., a National Guard camp has been enlarged considerably after being taken over by the Army. It was feared at first that an area of good agricultural land might be included in the enlarged camp site. The agricultural planning committee in the county furnished information on types of land in the county to Army officials which enabled the Army to acquire land without the withdrawing of any of the best lands in the county from agricultural production. Such examples are typical of the suggestions, recommendations, and plans which State, county, and community agricultural planning committees have offered in all sections of the country.

## Joint Planning of Research

Farm people, Federal agricultural workers, and research and extension workers in the State land-grant colleges have come to realize that the planning program fills an essential role in determining immediate and longer time agricultural objectives, and in coordinating the necessary action programs. One result has been a closer integration of Federal and State research with the objectives of agricultural planning. In about 20 States, for example, a program has been developed for the scientific delineation of communities and neighborhoods within the counties. In these States it is now one of the fundamentals of county planning procedure. Logical geographic areas for community-planning purposes have been determined by county agricultural planning committees, with the assistance and guidance of technicians of the Bureau of Agricultural Economics and of leaders in the State agricultural extension services.

Research agencies of this Department and of the land-grant colleges, work closely with the State and county agricultural planning committees. They do research calculated to assist the committees in their planning. This reorientation has made the work of research agencies of greater practical value to farm people. It has involved frequent consultation between research workers and agricultural planning committees, and has led to the joint planning of research programs. In many instances, the planning committees cooperate in actually doing the research.

In Kern County, Calif., for example, the county agricultural planning committee investigated seasonal fluctuation in requirements for farm labor, and studied the degree to which they could be met by laborers resident in the county. The survey indicated a need for more comprehensive information. Accordingly, the State college of agriculture undertook to make a survey in the county. It found

a surplus of resident labor even during the season of peak requirements. The county committee then named a subcommittee to work on the problems, and to maintain up-to-date estimates of labor requirements. The emphasis now is on maximum use of resident labor, with encouragement to labor not needed in the county to seek farm employment nearby.

A program of road improvement in Bryan County, Okla., illustrates results that come from the cooperation of farm people with local, State, and Federal agencies. After preliminary study of the need for rural roads and bridges, the county agricultural planning committee held a series of meetings. Farmers, school superintendents, rural mail carriers, Work Projects Administration representatives, county officials, and representatives of the State highway department, attended. It developed that nearly three-fourths of the bridges were unsafe, and that much of the road system in the county could be used only in dry weather. School superintendents and rural mail carriers helped to plan a program for maintaining essential school bus and mail routes. School districts acquired surplus graders from the State highway department. Farmers with teams and tractors and graders organized groups to grade the roads and clean out drainage ditches. Six communities and school districts in the county cooperated to carry on programs of road improvement. More than 200 farmers with teams or tractors volunteered to help. Arrangements were made to obtain needed gasoline from county and local funds. The county commissioners agreed to maintain drainage ditches in the future, and the Work Projects Administration agreed upon a program of bridge building with concrete and creosoted lumber.

### Planning for Multiform Objectives

Agricultural planning committees of Morrill, Scotts Bluff, and Sioux Counties, Neb., recognized that wind erosion, heavy farm-debt burdens, and tax delinquency were problems common to the area and organized an area committee to deal with them. This area committee recommended organization of a cooperative tenure-improvement association. The Farm Security Administration approved the recommendation, and set aside funds to be used by the association to lease or purchase sandy, irrigated lands, and to lease such land to low-income farmers on a plan of soil rebuilding. The association was organized. It is going ahead on a plan developed by the tricounty planning committee, which emphasizes adequate financing, erosion control, and supervised farm planning. Meantime, the three county agricultural planning committees had been active in forming soil conservation districts. In two of these counties, such district are now in operation.

## REPORTS OF STATE COMMITTEES ON FARM REQUIREMENTS

Everyone recognizes that the wartime emergency is potentially dangerous to agriculture as indicated by what happened after World War I. Farmers want to do their full part in the defense of democracy; they feel, however, that keeping their business sound is

part of the task. In fact, they believe that people as a whole, as well as the farmers, will benefit from wise action to strengthen agriculture. Such action, the farmers hold, need not lessen the defense effort. On the contrary, they regard it as a defense requirement. This was the consensus of all the reports received by the Department from the State agricultural planning committees. It formed the basis of comprehensive and detailed recommendations.

The recommendations dealt with such problems as nutrition and health, education and information, farm labor and youth training, rural works, land use policies and land management, conservation of soil, water, forests, and range resources, production adjustment and control, marketing quotas, marketing agreements, surplus removal and disposal, transportation, tenancy, and farm credit. In most of these fields the Department is already doing considerable work. The recommendations of the State committees indicate many opportunities for expansion and improvement of the Federal program as well as for the development of additional lines of action.

In a report issued July 15, the Department summarized the State reports and indicated some of its own views. The recommendations fell into three categories: (1) Current defense requirements; (2) what is necessary to round out a desirable continued agricultural program; and (3) planning for the post-war period. Naturally, the three groups of recommendations did not stand apart but closely meshed. Farm planning of a defense nature forwards the development of the long-time agricultural program, and has a bearing also on the conception of immediate post-war needs. The report dealt mainly with subjects that require action at the national level, but mentioned many points of regional interest as well, such as better utilization of the western livestock ranges. Some of the committee proposals are entering already into agricultural planning.

First in the recommendations for current defense activity is closer coordination of agricultural and defense planning. Advance planning of food requirements of military camps, for example, would give local farmers a better chance to plan their production and marketing. Other problems mentioned in the report include: Relocation of farm families pushed off the land by defense actions; planning of defense housing so that the facilities provided can be used by farm people after the defense emergency is over; the financing of public services in defense areas, especially for schools and roads, so that rural taxpayers will not be overburdened. Most of the State committees emphasized the importance of decentralizing defense industry to push the defense effort, spread employment, and provide outlets for farm products.

Management of priorities and of price controls deeply interested the committees. Agriculture needs fertilizers, machinery, rubber, gasoline and oil, insecticides and fungicides, and other productive equipment. Serious shortages will handicap the food-for-defense program. The reports urged action to prevent undue advances in the prices of these things, as well as action to avoid farm scarcities. They also recommended better coordination of agricultural marketing and of distribution by road, rail, and waterway. Several committees proposed establishment of a national transportation plan for agriculture, along with a plan for more storage of feed grains in the deficit feed

areas. There was widespread approval of increased taxation to reduce nonessential spending and check inflation.

Striking unanimity appeared in the recommendations with regard to nutrition and health. The National Nutrition Conference held at Washington in May, and reports issued subsequently on the health of school children and of men called to military service, evidently had a profound effect. The State committees urged: (1) Development of a unified national education program in nutrition and health matters; (2) increased Federal action to promote better national nutrition, especially action to expand the school-lunch program and distribute surpluses to low-income families; (3) action to meet the need for more doctors in rural areas; (4) Federal-State cooperation to establish and expand local public health services; (5) action to improve rural housing both as a defense measure and as a means of meeting post-defense needs.

### Forest, Range, and Farm Needs

With regard to farm labor, the committees emphasized the need for a unified Federal, State, and local program. Two aspects of the situation attracted special attention: (1) Labor shortages in certain areas, and (2) the related opportunity to relieve distress among jobless farm people. Specifically, the committees recommended an inventory of farm labor supply, along with the exchange of rural labor information among States and counties. Such a system, many of the State committees declared, would facilitate the placement of rural labor and give it more job security. Several States recommended that steps be taken to establish a fair scale of farm wages for farm laborers. Other recommendations called for more camps for migratory labor, particularly mobile camps, and the improvement of labor-camp facilities for sanitation, child training, recreation. and gardens. Some States urged the establishment of farm-labor conciliation boards.

In forestry, as noted elsewhere in this annual report, the defense effort raises critical new problems. Mills are running night and day in the great virgin forests of the Northwest and along the Pacific Coast. Lumbering is being extended into new areas. There is expansion of timber cutting in the older forested and wood-lot areas. Fire hazards have increased everywhere especially in the West where abnormal rainfall last winter resulted in a heavy vegetative growth that is now dry and inflammable. This speed-up in timber harvesting increases the danger of wasteful logging, of clear cutting, of second-growth cutting, and of inadequate slash disposal. There is a considerable letdown in forestry practice.

Harvesting of forest products for defense purposes, the committees said, should be done as far as possible with minimized waste and on sustained-yield principles. Other points made were: Advantage should be taken of the opportunity to utilize the less desirable species of trees and lower grade timber; prompt action is desirable to deal with the increased fire hazard, through additional legislation if necessary; maintenance and development of farm wood lots should be encouraged; campaigns should be launched to warn everyone of forest hazards created by the defense emergency.

Greater attention should be given, the reports said, to supplemental water projects, to new small water projects, and to the rehabilitation

of irrigation projects. In many areas this is essential to good range management. Farm production for defense depends greatly in western irrigated and range areas on the efficient utilization of scarce water resources. Water losses could be corrected. Various problems could be solved in the control and allocation of water rights. Numerous opportunities exist for new water developments. The main requirement is planning, especially where competition exists among agricultural, industrial, and power uses for water. Control of underground waters is an urgent problem in some States.

In range production for defense, it was the consensus that the best results require range conservation. Many range States fear that the lure of good prices may lead to overstocking, overgrazing, and serious injury not only to the range but ultimately to the production effort. The danger is greatest where land lacks grazing control. Effective handling of this problem calls for cooperation between this Department and State agencies. With ranges now stocked near to their carrying capacity, the committees agree that further expansion in range-livestock numbers is not desirable. They say it would not be good policy, even during the defense emergency, to abandon or weaken the sustained-yield principle. It is better, and also entirely possible, several reports said, to get the desired increased production through better range and livestock management. Several committees in the Southwestern States desire a range conservation program that would carry out a complete set of range practices within a single year and would distribute the payments over a period of 5 years. Under the head of production control some committees propose minimum price guarantees along with penalties for noncooperation or intermittent cooperation. Sound defense policy in the range area calls for speeded work in water development, in fencing, in predator control, in pasture improvement, and in watershed protection. Some grazing can be developed in areas now inaccessible. The competition between domestic livestock and game needs more attention.

Greater production of food crops and of feeds for conversion into foods should be sought chiefly through an increase in the output per animal or per acre. It should not depend heavily on developing new cropland or establishing new farms. This principle, which many committees ranked high among their recommendations, received unanimous endorsement. In some areas an increase in the crop acreage may be unavoidable. In such cases acreage additions should be on the better land, and should include soil-conserving practices. Many committees recommended considerably larger Agricultural Crop Production payments for accepted conservation practices as a means of offsetting the temptation to lapse into exploitative farming as farm prices rise. Government farm programs, it was recommended, should be used to accelerate the shift from crops for which normal export demand has fallen away over to crops needed by the democracies abroad. Such a shift would hold to a necessary minimum the expansion of our total acreage.

Several of the feed-deficit States recommended action to conserve or make feed supplies more accessible to livestock farmers. In the Northeast region, for example, increased stocks of feed grain in storage would help to prolong the flush-season milk flow. In the northern Great Plains farmers want a long-storage program for

roughage. The southern Great Plains needs increased feed production as the basis for increased livestock production, chiefly for farm use or farm-family consumption. Such arrangements, which involve the whole broad subject of production goals, could lead to farm adjustments suited to the post-defense period. The committees urge increased attention everywhere to farm gardens and production for farm consumption. Almost unanimously they endorse the program for acreage adjustments, commodity loans, and marketing quotas, which they believe will have to be maintained during and after the war.

### The Field of Distribution

In still broader fields the committees recommend action to expand and make fuller utilization of our transportation facilities; Federal and State efforts to improve the farm-marketing and farm-product distribution system; removal of barriers to interstate trade; expansion and coordination of the Federal-State system for grading and inspecting farm commodities, supervising markets, and disseminating market information; and better trade relations with other countries of the Western Hemisphere. Several committees note that agriculture should bear only its fair share of any burdens that may be involved in hemisphere cooperation. They agree that mutual trade and cultural development should be fostered within the Western Hemisphere, particularly trade in noncompetitive products. Some committees advocate unrestricted trade among the countries of the Western Hemisphere, along with a pan-American program for sharing the world demand for agricultural products. It seems to be the general view that improved hemisphere cooperation holds promise rather than difficulty for United States agriculture.

### Merging Defense Into Post-Defense Planning

In their recommendations for continuing and rounding out the existing farm program the committees lean partly on current defense planning. Many of the things that should be done now, they point out, are also the things that will put agriculture in a better position for the future. Much of agriculture's defense program to be sure has its roots in policies developed before the emergency arose. This is true of production adjustment, of soil and water conservation, of shifts from surplus production to production increasingly for domestic requirements, of surplus distribution through the stamp plan, school lunches, and other surplus-disposal programs, of farm-tenure improvement, of tenant-purchase operations, and of farm-credit improvement. These measures equip agriculture to make general crop adjustments quickly either upward or downward. But the special defense programs, with the emphasis they put on livestock, dairy, and poultry production, go a long step further. They vastly accelerate the tempo of the desirable total adjustment. Naturally, however, some aspects of the current activity are more definitely of a longtime character than others, and these the committees mark out specially for improvement and development.

They give great attention, for example to the problem of high-risk, tax-delinquent, submarginal, and publicly owned land. They call

for land classification of many areas; for an increased program of land acquisition by public agencies; for simplification of the process whereby States and counties can get title to tax-delinquent lands; for zoning and other measures to prevent the resettlements of lands not suited to cultivation; for the development of "flexible" farms with adequate feed, food, and cash reserves in high-hazard areas; and for increased Federal contributions in lieu of taxes on Government-owned land. Several committees urge vigorous action to guide new land settlement. They offer suggestions for the acquisition by public agencies of land suited to colonization, along with plans for clearing, draining, and subdividing it in a manner likely to attract and hold good settlers. Expansion of the tenant-purchase program has the approval of nearly all the State committees.

It is the opinion of many State agricultural planning committees that farm-credit agencies should adjust their policies to farm production goals. Specifically, many committees recommend that credit agencies should encourage production in the lines stimulated by the prevailing war situation and discourage it in the lines that war depresses. Also the committees believe credit agencies should be careful about extending credit for agricultural expansion. In periods of rising prices and active consumer demand, credit standards tend to be relaxed. This tendency can best be checked, the committees believe, by coordinated national, State, and local effort. This need not conflict with the use of credit to convert farms that are too small into family-size farms. Some committees urge the establishment of unified credit centers where farmers can discuss all their credit needs and get coordinated credit services.

### Maintaining Family-Size Farms

Nearly all the State committees emphasize the importance of action to develop and maintain the family-size farm. The belief is gaining ground that the benefit from Federal programs to larger operators should be limited; that the activities of Federal action and credit agencies should encourage the organization and operation of farms large enough and with sufficient resources to afford a decent family income; and that conversely the policy of giving subsidies to undersized or otherwise uneconomical units should be dropped.

Since, however, it seems inevitable that undersized farms will be numerous in many areas for a long time, the need will continue for rural rehabilitation and supervized farm management. The committee reports generally recognize this fact. One important suggestion is that feed and seed loans should be tied closely with the operations of the Farm Security Administration. Many of the committees urge the adoption also of a more flexible farm credit system generally, with facilities for varying annual payments as farm income varies.

## HIRED LABOR IN AGRICULTURE

Agricultural laborers as well as other groups in our farm population have been affected by the war situation and the defense program. Many workers have left the farms to work in defense industries; others have joined the armed forces of the country. The number of persons available for work on the farms has decreased during the past year.

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Between July 1, 1940, and July 1, 1941, the total number of workers on farms decreased from approximately 12,037,000 to 11,769,000. Most of this decline was in unpaid family workers, the number declining from 8,925,000 to 8,664,000. The reported number of hired workers declined by only 7,000. The supply of agricultural workers is continuing to decline, possibly more than these figures indicate. Some areas of the country have reported serious shortages. Fortunately, these areas were few and in many the shortage has not proved as serious as originally anticipated.

Fewer hands to help with the expansion in production of vegetables, pork, poultry, eggs, and dairy products essential to the program for domestic defense and aid to Great Britain has created serious difficulties for many of our farmers. Fortunately, farm people have risen to the emergency. More farmers are exchanging work and sharing equipment. Women and boys and girls are taking the places of the men called from the farms. If present trends continue, however, the situation will become much more serious during the coming year.

The Department is fully conscious of these latent problems in the present defense effort. Steps have been taken to anticipate them and to provide the best possible solutions so that the agricultural defense effort can achieve a full measure of success. The Agricultural Labor Committee of the Department has devoted much time and thought to the best means of coping with the situation. Positive action has been taken.

The Department has worked closely with the Selective Service System in an effort to assure that proper consideration is given to the deferment of agricultural workers necessary for the agricultural defense program. The Works Projects Administration is proving especially cooperative in releasing workers for available farm jobs. The Farm Placement Service of the United States Employment Service and many of the State employment services are assisting by providing effective facilities for the placement of farm workers.

In addition, subcommittees on farm labor have been established in most States. These committees have been charged with the responsibility for keeping the Department informed on the labor situation in their communities. They have devised plans for assisting the farm-placement activities of the public employment services. By means of surveys and personal investigations, they are keeping themselves and the Department informed currently on the labor situation.

In a period of relative labor scarcity and of rising farm incomes it is quite natural that wage rates should rise. From July 1, 1940, to July 1, 1941, the average agricultural wages per day without board have risen from $1.62 to $1.98. This continues an upward trend which began in 1934. If one were to look only at these figures the conclusion might be reached that the farm labor situation has been greatly improved. Improvement there has been, but much more remains to be achieved.

## The Longer Future for Agricultural Laborers

The long-run outlook for agricultural laborers is not encouraging. The basic problem of agricultural labor is a surplus of workers in the rural population. The present acceleration of industrial produc-

tion and the enrollment of many farm workers in the armed forces are affording temporary relief. It is too much to hope that the basic maldistribution of manpower between industry and agriculture will be permanently corrected by defense activities. Rather, at the cessation of the national defense effort men will return from the armies to their normal occupations and the production of armament and munitions will probably be curtailed. When this happens, the surplus of agricultural workers will again back up on the farms. That surplus labor means low wages, unemployment, and underemployment is well known. As long as the increase in rural population exceeds the needs of agriculture and the ability of industry to absorb the surplus the problems facing farm laborers will remain most serious.

In addition to the fundamental problem of more persons being born on farms than are needed to carry on the farm work, there are other basic trends which aggravate the problem. The number of tractors on farms has increased from about 1,000 in 1909 to 1,725,000 in 1940. The sale of combines of all sizes was only 1,000 in 1923 but had increased to 38,000 in 1940. Seven thousand corn pickers were sold in 1927 and 109,000 in 1940. This means fewer workers needed. The tractoring off of sharecroppers in the South is simply one of the most striking evidences of a country-wide tendency in agriculture to supplant men with machines.

There are other less evident technological changes and scientific improvements which have the same effect. Better farm methods, improved seeds also reduce the demand for labor. Agriculture is constantly increasing its efficiency and productivity and is using less labor. During the past 15 years, an index of agriculture production increased from 97 in 1925 to 107 in 1939. In the same period the average number of laborers employed on farms decreased from 11,448,000 to 10,629,000. At the same time international trade in agricultural commodities became disorganized. Some of our foreign markets were lost, possibly forever. The effective demand for our agricultural production decreased and with it the demand for workers to man the farms.

In the past the traditional career of the agricultural laborer was up the agricultural ladder to tenant and owner. This opportunity is no longer available for most wage hands. In fact, there is an unfortunate trend in the opposite direction with tenants becoming wage workers.

### The Post-Defense Farm-Labor Problem

The termination of hostilities and the return of the world to peace and stability will intensify the problems of agricultural workers. Unless the necessary readjustments in industry are carefully planned, unemployment will result. The opportunities of rural people in industry will be curtailed. At that time the Department must stand ready with well-considered plans to alleviate the inevitable distress.

The low wages of agricultural workers, underemployment, and unemployment are caused primarily by the surplus of farm workers, but the organization of agricultural production also contributes to the evils of underemployment. The seasonality of agricultural work produces peaks and valleys of employment. Crops which require hired help mainly for short harvest periods create additional dislocations

in the labor market. The evils which have attended the required migration of workers to fill these needs are familiar. Poor and unsanitary housing, lack of educational opportunities, low earnings, and long periods of unemployment characterize the working and living conditions of these workers and their families especially, but are not absent from the experience of the nonmigratory worker.

If these conditions could be remedied the position of the agricultural laborer would be measurably improved. Some agricultural operations can be organized to provide more continuous employment. The rationalization of employment practices under the guidance of an efficient farm-placement system utilized extensively by both farmers and workers offers more promise. If the period of employment can be extended, the laborer's income will tend to rise. This partial solution to the farm-labor problem of underemployment and low incomes should receive more attention than has thus far been accorded it.

## The Department's Responsibility

As long as many farm workers during the year earn only $300 and work in many areas only 180 days, as long as many men must move aimlessly and unguided in search of work, as long as housing conditions remain below standard, as long as living conditions breed disease and despair, in short, as long as economic insecurity and social instability characterize the lives of so many of our farm workers, the Department cannot remain inactive. Democracy should hold more promise than this for these people.

To industrial workers, legislative achievements of the past few years have brought the boons of fair wages and hours and a measure of social security. The time must come when similar benefits are extended to workers on the farm. The benefits of such a program will accrue, not only to the farm laborers, but also to the farmers, both directly and indirectly. Indeed farmers are themselves entitled to and should receive some of the benefits of existing social security provisions.

All efforts to improve the condition of farm laborers must rest ultimately on the ability of our agricultural and our national economy to support such improvement. The basic need of larger farm incomes must be faced. It may be possible here and there to improve the present sharing; but the goals that have been set demand a larger income to share. Yet the Department does not intend to wait for some set fund of larger income to be returned to agriculture before taking steps to improve the lot of farm laborers. Better farm-placement services, improved housing, better health and educational facilities, more security from unemployment, and better provision for old age are things that can be striven for day by day. Economic and social forces can be modified so that agricultural labor may share more equitably in the wealth and privileges of the country.

One basic trouble with agriculture is the tendency of many farmers to underrate farm skill and knowledge. They do so for the sake of keeping down farm wages. But the practice hurts themselves as well as their employees; it falsifies the costs of farm production, and results in returns that do not cover the costs. Farmers suffer along with their employees because they themselves are laborers and derive

most of their income from the work of their hands and brains. This penalty results even in ordinary times with the market place setting farm prices. Farm wages that are too low simply mean that the farmers as well as their hired hands get less than their work is worth. In times like these, with legislation and other social procedures largely influential in farm returns, it is more important than ever that the costs of farm production shall be truly stated. Practically, this means that farm wages shall equal the value of the farm work, because otherwise the difference falls on the community in expenses for rural relief. Our pattern of farm objectives ought to include establishment of a thoroughly fair value on the skill and knowledge involved in agricultural production, and this valuation should benefit farm laborers equally with farm operators. It should be on a parity, moreover, with the valuation of equal skill and knowledge in other occupations. Equality for agriculture will then include the entire agricultural personnel.

## EMERGENT GROUPINGS IN THE FARM POPULATION

There is information in the 1940 census that may throw some light on the future of our agriculture. First, the census shows that although the total population of the country increased by approximately 9 million, the farm population did not increase. In fact, it even fell off a fraction of 1 percent.

That the farm population should have remained static in a decade of industrial unemployment and also of rapid increase in the total working-age population is surely significant. The high rural birth-rate regularly provides a surplus of rural youth. Under conditions of normal or expanding industrial conditions this surplus migrates toward industrial opportunities or moves to new agricultural frontiers so long as there are any. With the frontier gone, however, and with industry unable fully to employ its own regular working force, it had been assumed that the cityward movement would cease and that the tide of migration would, in fact, turn farmward. This assumption proved incorrect, except for 1 year in the decade. For the decade as a whole the net migration was about two-thirds that of the predepression decade.

The census showed strong pressure of population upon the land, and revealed that industrial opportunity remained relatively attractive to rural young people even in a period of industrial slackness. It was taken before the defense boom got under way. Had it been taken some months later, it would have shown a still stronger preference of rural youth for city employment. Recent reports indicate that large numbers of rural people have moved from the countryside toward centers of industry, and the trend continues.

Another significant revelation of the 1940 census is the peripheral growth it shows around metropolitan and industrial centers. Most of these did not themselves increase in population during the census decade. Many actually decreased. This development indicates a tendency for industry and even more for people to remove from the heart of metropolitan areas into the suburban and outskirt areas.

Casual consultation of the census may mislead one with regard to this fact. Many of the employees of the suburban industries live in

areas that the census classifies as rural, often on places classified as "farms." Hence, the recorded total farm population may be somewhat deceptive. It may include many persons as residents upon farms that are not actually engaged primarily in agriculture. There is no way to tell how far this is true. In whatever degree it is a fact, however, it adds still more significance to the indicated decline in the proportion of our people who are primarily employed in agriculture.

## Analysis of Census Returns

The 1940 census reports a total of 6,096,799 farms. But does the census definition of a farm exactly fit the concept that we use in thinking about the over-all problems of American agriculture, particularly its economic problems and its relationship to other parts of the national economy? One analysis indicates that on nearly a million of the farms reported by the 1940 census agriculture is incidental to other occupations and sources of income. These include the homes of retired farmers who continue to live on the farm, city people who have retired to the country, summer residents, part-time farmers, etc., as well as tracts of land without buildings that require only the seasonal attention of the operator. A relatively high proportion of these farms are fully owned by the operator.

Approximately another million of the 1940 census farms are essentially submarginal. They are small, or on unproductive land; frequently the equipment, the capital, and the managerial ability are inadequate. Relief or outside work may supplement the low income from farming. Production is primarily for subsistence and little is sold on the market. There is a high proportion among them of the aged, the infirm, widows, and invalids.

A third group consists of nearly 2 million small family farms. These are of average size or smaller for the area and produce both for their own use and for the market. They include many of the middle-sized farms in the South, and the smaller, less productive, less mechanized farms in the North and West. A high proportion of these operators are over 50 years old and cannot shift to other occupations. When they die or retire some of their farms will be taken over by neighboring farmers and consolidated into larger units. They hire little or no labor and on the average do not maintain their capital and equipment.

A fourth group consists of about 2 million family farms, larger than average in size for the area, on fair or good land, and with adequate equipment, capital, and managerial ability. The operators and their families do most of the work but some labor is usually hired, particularly during the rush seasons. These farms account for most of the national production of the staple crops and livestock. Many of these operators are part owners and tenants. They are the expanding, dynamic group, quick to adopt new methods, the most important farm group in terms of the national economy, and from the standpoint of agricultural production as a whole.

Also, there are a small number of farms, perhaps a quarter of a million, that include corporation farms, institutions, hobby farms, and the like. These are usually owned and controlled by city people. They are particularly important where marketing problems are

closely related to production—as in fruit and truck-crop areas distant from market—and where large investments and great technical skill are required for sanitation and low-cost production; as in the production of certified milk, poultry in large numbers, and new specialty crops.

Some of these large farms are operated by processing or marketing companies that want an assured source of supply or by companies that sell farm equipment or supplies and wish to test their products. Others are hobby farms or country estates that provide an outlet for capital acquired outside of agriculture. They reward the owners largely in an enhanced feeling of security or in the satisfaction of a craving for country life. Hired personnel does practically all of the work and most of the managing. These farms of course enter into the census total; but they have not yet become sufficiently numerous to establish any broad trend toward concentration.

## No Turning Back

There is a tendency to regard current changes as temporary, and to look for a return to former conditions. Experience and also the opinion of social scientists warn us not to expect that. Some of the changes now taking place may not be permanent; but the future will never closely resemble the past. The road we have traveled will never be retraced.

The current population movement from rural to industrial areas, which betokens suddenly released pressure on the land, may not be reversed. It may only slacken when the defense effort declines. That it will give place to a large return movement, to a new trek back to the land, seems improbable. Mechanization and other progress in farm technology, reorganization of farming methods and procedures, and current regional shifts in farm production are probably here to stay. New methods, new types of farm organization, and associated new investment will strike deep roots. They may overcome the whole force of interest, custom, tradition, and social inertia.

The drive toward greater efficiency in the use of labor undoubtedly is here to stay. It draws impetus especially from the defense emergency, which makes agricultural labor scarcer and higher in price. We may expect a continued trend toward more efficient commercial farm units. We may also expect, whether we like it or not, that the bulk of agricultural products that reach the market will come more and more from farms that employ the most efficient methods and the most rational type of organization.

It is not likely that the American people will ever again tolerate long and severe deflation such as paralyzed the economy from 1929 to 1933. Elections since have indicated a determination to ward off such catastrophes through Government action. Apparently democratic government, by positive action, can avoid national economic tragedy. It is therefore safe to predict that when the defense effort slackens, industrial activity and production in other lines will take its place eventually. The country simply will not tolerate the wholesale release of defense employees into idleness and want. It will consequently not be so likely to have an overpowering rush back to the farms.

Hence, we may expect a stronger trend toward commercial family farm units of medium or above-medium size. Operators and families of the smaller, less efficient farms, on the other hand, will tend to be drawn more into industry. The farms they operate now may gradually be consolidated into larger units. Farm-to-city movements of population never work out just right from the standpoint of economic advantage. Recently, for example, some regions of great rural poverty, of dense rural population, and of scanty agricultural resources have sent proportionately less of their youth to the towns than other more prosperous farm areas. Among the reasons is probably the fact that education is poor in many areas of serious rural population pressure. Farm people in such areas have not been able to prepare for industrial or urban occupations. But the current trend should lessen this type of maladjustment.

## MIGRATION AND ITS PROBLEMS

After gathering a vast amount of evidence, the Tolan Committee on Interstate Migration issued a report last April. The report declared that modern problems of agricultural migration are traceable essentially to the increasing application of technology on farms and to the extension of business-organization methods in agriculture. It said that measures to cope with migration problems must recognize these basic causes. There is an associated problem of "defense migration." This, of course, is the movement of labor both urban and rural to defense-industry locations. It may leave an aftermath of difficult human problems, the Tolan report implied.

Testimony at hearings of the Tolan Committee dealt exhaustively with the indicated basic causes of excessive rural migration. For example, it showed that large-scale industrialized farms provide an increasing share of our commercial agricultural production. The report noted that between 1910 and 1935 the number of large farms of 500 acres or more increased 67 percent. In the same period, the number of farms of 20 acres or less increased more than 55 percent. Meantime, the number of medium-sized farms (farms ranging from 20 to 500 acres) remained about the same. Moreover, the report noted that about 50 percent of all the farms in the United States produce about 90 percent of the total commercial farm output. Obviously, the other half of the farms are mainly noncommercial.

Another important fact emphasized in the Committee's report is the extent to which during the last quarter of a century the production of staple farm commodities has been concentrated. In Arizona in 1929, for example, less than 3 percent of all the cotton farms were large-scale farms. Nevertheless, this small percentage accounted for more than 25 percent of the State's cotton output. It accounted for more than one-third of the expenditure for labor on cotton farms in the State. Similar tendencies appeared in wheat, corn, tobacco, and sugar growing, and in the fruit, truck, and dairy farms of New Jersey and California, often associated with concentration of ownership.

In 1938, 21 large life insurance companies owned farms valued at more than half a billion dollars. They owned farm mortgages besides, with a value of nearly three-quarters of a billion dollars. Power units on the farm, animal and mechanical, increased almost 100 percent

between 1920 and 1930. This power growth had an offset on the man-labor side. Man-hours required to produce staple commodities declined substantially. The Committee reported that wheat required only 6.1 man-hours per bushel in the period 1934–36, as compared with 12.7 hours in the period 1909–13. The number of workers required for farm production in the United States declined from 12 million to 10 million between 1909 and 1939.

Turning from production to income, the report cited the census figures and offered comments thereon. In 1930, according to the census, 50 percent of all the farms in the United States produced only 10 percent of the gross cash income from agricultural production. More than 1.6 million farms in that year reported a gross annual income of less than $600. Out of this average these farms had to meet all farm-operating expenses and family-consumption needs. In 1936, 1.7 million farm families had an average annual income of less than $500. Half of these families had an average annual income of less than $250. For these 1936 figures the Tolan Committee relied on the National Resources Committee. Broadly, the Committee indicated, the evidence pointed to a serious decline in economic opportunity for the operators of family-sized farms.

### What Becomes of Displaced Operators?

The Committee sought to learn what had become of displaced farm operators. Testimony from migrants, farm operators, agricultural officials, insurance companies, bankers, and other persons showed that mortgage indebtedness and tenancy had been the steps by which hundreds of former independent farm owners had sunk to the ranks of homeless migrants. In the period 1930–40, said the Committee's report, almost 1.7 million mortgaged farm businesses failed. The addition of failures among farm tenants would carry the figure well above 2 million. In other words, nearly one-third of all the farms in the United States failed in the 1930–40 decade. The operators had to seek other sources of income. Many of them joined the army of the wanderers. They struggled for a precarious job in an agricultural labor market characterized by disorganization, exploitation, and substandard working and living conditions. In 1940, the Committee said, the reserve of unused and ineffectively used manpower in that market amounted to at least 5 million workers.

Farm families that had lost their former position but did not join the migrants were likewise in dire straits. They, too, said the report, felt the pressure of increasing farm commercialization. In large numbers they stayed on farms only because the holders of mortgages did not think the farms were worth taking over. Economists told the Committee that thousands of farms subject to foreclosure have not been foreclosed as yet because the holders of the mortgages do not consider that the farms are worth owning. Occupants of such places have no chance of a decent living with farm prices at low levels and small chance of retaining their tenure if farm prices rise. They are doomed either way the price level goes. Low prices will deprive them of sufficient income; high prices will make their places attractive to the mortgage holders and will lead to foreclosure. Even those who hold on will have difficulty in competing with highly mechanized large-scale farming.

Along with the migration of rural people, the Committee noted an even greater interstate movement of nonagricultural migrants. Thus in 1937 farm migrants aggregated about 1 million individuals and families. Nonfarm migrants in the same period totaled about 4 million. These were the interstate migrants—the persons who crossed State lines. They moved from the country to the town, from the town to the country, or from one city to another. There was a considerable, though unrecorded, intrastate movement of population, a migration within State lines. The nonfarm migration resulted largely, until the defense program got under way, from urban unemployment. Part of it resulted from the attempts of some States to deal with transients through State settlement and welfare laws. Several States passed legislation to prevent or limit the giving of help to the moving population. Such laws, however, only forced the migrants to move again.

Many of the homeless, said the Committee's report, are migrating now to defense centers. In April last, when the Committee reported, the prevailing scale of the defense effort did not indicate that it would totally eliminate unemployment. There was no doubt, of course, even then that the defense program would greatly reduce unemployment. It was evident, however, that the program would entail some dislocation of workers and would actually necessitate migration to bring worker and job together. In December 1940, for example, 85 percent of the defense contracts had been let in 12 States, which contained 48 percent of the Nation's population and 45 percent of the total WPA employment. Up to February 1941, 20 industrial areas, with 19 percent of the total WPA employment among them, had received 73 percent of the funds for defense orders. The orders effected a considerable shift from WPA to defense employment. Nevertheless, according to the Tolan Committee, the migration problem, both in its long-time aspects and in the phases of it that grow out of the National Defense Program, will continue to be a matter of national concern. Action taken with regard to it will mark a new phase in the social direction of interstate movements of population.

## BETTER HOUSING FOR FARMERS

The Department devoted increased attention during the year to the problem of rural housing, an exhaustive study having been completed by a special Interbureau Coordinating Committee. Publications based on this committee's work are now available, notably those entitled "The Need for Improved Rural Housing" and "Recommended Minimum Requirements for a Farm House."

Government acquisition of land for military needs displaced thousands of farm families. This necessitated public aid, assistance with housing, and help for displaced families to become reestablished in suitable locations. The Department also assisted in providing decent housing for workers drawn into new defense industries in rural areas.

The Office of the Housing Coordinator called upon the Farm Security Administration to supply and manage temporary housing for workers. Chosen for this duty because of its experience in pro-

viding both permanent and mobile shelters for migratory farm laborers, the FSA completed temporary housing for nearly 10,000 defense workers in 14 States from Connecticut to Washington. Sanitation was a primary consideration in this "stopgap" housing.

In addition, at the request of the Federal Works Agency, the FSA supervised the construction of permanent defense housing in several areas. Some of these dwellings are being built on nearby farms so that when the defense emergency has passed, the houses can be used by farm families. This will help to improve substandard housing on farms and will enable the Government to salvage a considerable part of its defense investment. Among the earliest projects of this type were one at Radford and another at Pulaski in Virginia.

State and county land use planning committees surveyed defense-housing needs in a number of areas. These committees are composed of farm men and women and representatives of State and Federal agricultural agencies. Their surveys revealed serious inadequacy in farm housing. For example, of 24,723 farm families in the Coosa Valley, Ala., defense area, 16,429 were inadequately housed in the opinion of neighbors who made a survey. The entire survey covered 12 counties; it was completed in 4 weeks with the assistance of 1,748 farm people. In the Radford, Va., area a similar survey revealed that of 6,928 families 2,636 were inadequately housed in the opinion of their neighbors.

These surveys helped to coordinate defense housing with work for better housing on farms. The land use planning committees obtained survey help from the Bureau of Agricultural Economics, the Extension Service, the Farm Security Administration, and other agencies. The Forest Service, the Extension Service, the Bureau of Agricultural Chemistry and Engineering, the Farm Security Administration, the Bureau of Home Economics, and the Rural Electrification Administration gave technical help in defense housing. In addition, the Department continued work previously started in the field of rural housing.

## Housing Projects of FSA

The Farm Security Administration now administers approximately 150 resettlement projects, which house around 13,000 farm families. Also it has a number of camps for migratory labor. In selected areas throughout the Nation it is loaning money to tenants, sharecroppers, and farm-laborer families for the construction or repair of houses in connection with the tenant-purchase program. It is helping to finance low-cost housing for a number of sharecroppers and other farm families displaced by increasing mechanization of agriculture.

In all projects of the FSA housing at the lowest possible cost has been essential. Costs have been held down in many cases by precutting with power saws at a central plant, and even by prefabrication where the concentration of houses makes that feasible. In spite of the low cost, the homes provide necessary services for the farm, with space for washing, cooking, canning, butter and lard making, and winter storing. Yet viewed alongside the task that remains, we can see that only a beginning has been made.

In 1934 a Farm Housing Survey was conducted as a CWA project under the direction of the Bureau of Home Economics in cooperation with the Bureau of Agricultural Engineering, the Extension Service, and the Office of the Secretary. The survey found nearly 700,000 farm dwellings to be beyond repair. Replacement needs since 1934 have probably exceeded new construction by more than 50,000 homes a year. Probably at least 1 million farm houses are now beyond repair. Construction of 2 or 3 million new houses in rural areas would be necessary to provide the minimum essentials of adequate housing for all farm people. The 1934 Farm Housing Survey found that 15,200,000 major repair jobs were needed on the 7,360,000 occupied farm homes. Since then overdue repairs have continued to pile up.

Some 84 percent of the houses surveyed in 1934 had no running water; 27 percent had no screens; in 42 percent screens were broken or otherwise faulty; 83 percent of the dwellings were either unpainted, or the paint was in poor condition. Approximately 5.3 million homes lacked kitchen sinks. Only 9 percent of the farms had indoor toilets. More than 13 percent had no toilet at all. Foundations, walls, and roofs were in poor condition in 1 out of 4 of the houses studied. These figures took no account of housing among migratory agricultural workers, who often live in tar-paper shacks under desolate conditions.

Polluted water, vermin, and disease are familiar companions of families compelled by poverty to live in slum houses. Such conditions cannot nourish good citizenship. The man whose home is an abandoned boxcar, or even a house where flies and rain come in with equal ease, may wonder how great a stake he has in national defense. Rural slums, like their urban counterparts, are most likely to produce men physically and mentally unfit for military service—whole families with the hopeless feeling that no change in the form of government can seriously worsen their lot. More than a million farm families live in slum houses. Even more disturbing is the fact that rural slums are growing worse through failure to repair or replace inadequate farm houses.

It is extremely important to consider the quality of our rural housing. As defense priorities permit, the provision of better homes should be promoted vigorously. It is an important means of maintaining a united national front. Comprehensive housing programs during the post-defense period would furnish useful employment and would help to prevent a depression. They would create a more desirable type of living for the post-war period.

## EVOLUTION OF OUR LAND POLICY

Our earliest national land policy was fashioned out of the conviction that each man, in this New World, enjoyed a right to unrestricted ownership of a parcel of land. It was not until 1862, however, when the Homestead Act was passed, that the idea of providing free land to settlers gained sufficient strength to be written into law. The Homestead Act permitted the head of a family to obtain 160 acres of land practically free of cost by living on it for 5 years. This policy held on long after its usefulness had passed.

In the East 160 acres was ample for a family. Transplanted west of the Mississippi Valley, however, the homestead policy failed. In the arid and semiarid sections of the western plains 160 acres could produce not even a bare subsistence for a family. Not until the twentieth century, after practically all of the arable acreage had been taken up, were the homestead laws modified to allow settlers to stake out more than 160 acres. Even under the amended homstead laws the units established were too small in many areas.

Our early timberland policies were even less successful. For more than a century no policy at all was formulated to prevent wastage of timber resources. The Timber and Stone Act of 1878 did little more than authorize a legal procedure for selling timberland, in blocks of 160 acres, to private individuals for $2.50 an acre. Through abuse of this act and various subterfuges, corporations and others acquired and promptly devastated thousands of acres of our finest forest lands. It was not until 1891, when Congress authorized setting aside timber reserves, that conservation of resources became a part of the Nation's land policy.

Many of the land use problems we face today began to appear long ago. The trend of tenancy had long been upward. The march of cotton from east to west across the South had left a trail of erosion-scarred abandoned land. As long ago as 1878 Major J. W. Powell, in a report to Congress on the lands in the arid regions, warned of the ill effects of the homestead policies. In 1904 the Public Land Commission reported overgrazing of the public domain. Foreign outlets for our farm products had gradually tapered off, and farmers had to grow less for export. Slowly the Nation was awakening to the need for conservation. Then came the war of 1914–18 in Europe. It temporarily diverted attention from the developing conservation policy, reversed the market and land use trends, and let loose forces that brought catastrophe.

Spurred on by patriotic urgings and wartime prices, farmers put practically every available acre to use with little knowledge of or little regard to the proper uses of the land. Plows swept over the western grasslands. Abandoned eroded cotton farms, which were healing under a dressing of young trees, again were plowed. Natural pastures became wheat and corn fields. More cattle and sheep than they could support were turned onto the forests and grassland ranges in the effort to utilize every bit of forage to produce beef, mutton, and wool. The growing power of farmers to produce, augmented by an almost general use of machinery, met the wartime call for more production at the expense of our productive resources.

## Our Land Legislation

Farmers up to the end of the nineteenth century had chiefly asked the Government for free land and for some simple services. They wanted the Government to collect and distribute seeds, plants, and information. The first Government response came in 1839 when Congress appropriated $1,000 for collecting and distributing seeds, conducting agricultural investigations, and procuring agricultural statistics. Amid the turmoil of the Civil War, Congress created the United States Department of Agriculture. In 1862 Congress, in

three acts, expressed the new public policies toward agriculture. The first of these was the Homestead Act; the second was the Act creating the Department of Agriculture; the third was the Morrill Act donating land to the States for the endowment of colleges of agriculture and the mechanic arts.

Subsequent acts of the Congress provided important Federal services to agriculture. The act of May 29, 1884, established the Bureau of Animal Industry to prevent the spread of contagious diseases among cattle. In 1887 an act authorized the establishment of State experiment stations to be administered under direction of the State agricultural colleges. In 1891 came the first move toward conservation, in an authorization for the President to set aside forest reserves from the public domain. In the next 10 years Congress passed the Animal Quarantine Act, the Food and Drugs Act, the Meat Inspection Act, the Plant Quarantine Act, the Federal Seed Act, and other regulatory laws designed to control the natural enemies of agriculture and regulate abuses in marketing. The Weeks Act of 1911 authorized conservation work with States and the purchase of forest lands for inclusion in the national forests.

Passage of the Agricultural Extension Act of 1914 and of the Smith-Hughes Act of 1917 placed the capstone on the agricultural educational structure. The Extension Act authorized the Department and the land-grant agricultural colleges to give instruction in agriculture and home economics to persons not attending colleges; it established the county-agent system. The Smith-Hughes Act, now administered by the Federal Security Agency, subsidized the teaching of agriculture in rural high schools. After World War I, with surplus farm people unable to find jobs in cities, with farm foreclosures multiplying, with tenancy in swift increase, with erosion spreading, and with rural purchasing power at a low ebb, the country embarked on a new program. The first object was to help farmers get rid of price-depressing surplus supplies and adjust their use of land to the contracted market.

## Local and Regional Adjustments

Crop adjustment to the total national market, plus some export demand, however, was not enough. Local and regional land use adjustments were also necessary. In the Dust Bowl, for example, there was maladjustment between farming and climate. Duststorms of unprecedented magnitude swept much land that should never have been plowed. It was imperative to readjust the use of land, not only to the market, but to the dictates of nature. It was a problem in economics and sociology, as well as in agronomy.

Many other regional adjustments were necessary. There were special land problems in the cut-over areas of the Lake States, on the overgrazed western range, in the eroded Piedmont, in the northern Plains, and elsewhere. National interest in soil conservation awakened. Gullying, which had ruined many thousand of acres, was a common alarm signal. Sheet erosion, caused by rain water carrying the soil from sloping cultivated lands evenly, came more slowly into recognition as a serious evil. Surveys showed that some 57 millions of acres already had been essentially destroyed for further tillage; that erosion had removed more than three-fourths of the topsoil from

12 percent of the land, or 225 million acres; and had removed one-fourth to three-fourths of the topsoil from 41 percent of the land, or 775 million acres.

The Government determined to help farmers use their land in such a way as to maintain its productivity. One basic task was to discover and demonstrate methods of cultivation and land use which would retard the water run-off and reduce materially the rate of erosion on sloping lands. This the Congress empowered the Department to do, at first through the Soil Conservation Service. An enlarged research and demonstration program was an early result. It indicated the use of various measures in watershed areas of 25,000 to 100,000 acres. The next problem was to spread conservation practices to farms other than those in the demonstration areas.

### Complementary State Action

The President and the Department in 1937 urged the States to enact laws patterned after a sample law known as the Standard State Soil Conservation Districts Act. This was drawn so as to permit groups of farmers to organize local soil conservation districts and, with the help of public agencies, to engage in cooperative action to control erosion. The State soil-conservation-district laws, now enacted by 42 States, place the responsibility for formulating and carrying out an erosion-control program squarely upon the shoulders of local people. Early in 1941 more than 550 soil conservation districts were in existence.

The Government recognized too that it would have to do something about submarginal land. Much land that is submarginal for agriculture was poorly adapted to farming even when it was fresh and new. Much additional land has been made submarginal by using or farming it in bad ways. The problem was to shift such land from a poor use to a better use. First with emergency funds, and later with funds under Title III of the Bankhead-Jones Act of 1935, Congress provided a beginning. Title III authorizes the Department of Agriculture to purchase lands unsuited to cultivation and develop them for other uses. By itself, however, the purchase of submarginal land is seldom if ever adequate for achieving the rehabilitation of an area. It has to be combined with other land use adjustment programs, notably with broad efforts to diminish the incentives to exploitative, submarginal farming.

The problems of submarginal land and of rural poverty often go together. Rural poverty tends to be worst in areas of greatest soil depletion, and it tends to perpetuate the soil wastage. There are poor people on good land. Generally, however, population increases faster on the poor land than on the better land. So the problem of submarginal land is also the problem of submarginal farmers. In the depths of the depression, the Federal Emergency Relief Administration relieved rural poverty. Approximately 1 million farm families received help immediately. Since then 3½ million rural families have received public assistance, and at least 2 million of these are farm families. Many live in single cash-crop areas. They are the victims of low farm prices as well as of soil erosion, floods, duststorms and other adverse conditions.

## Methods of Rural Rehabilitation

Most of them need credit and guidance in farm and home management. Congress gave this job at first to the Resettlement Administration, an independent Government agency, and subsequently turned it over to the Farm Security Administration in the Department of Agriculture. Small rehabilitation loans to farm families who cannot get other credit enable them to purchase necessary farm supplies, livestock, seed, fertilizer, feed, tools, certain household equipment, and food and clothing. Three main precautions provide assurance that the assisted family will persevere in the rehabilitation plan. One is guidance in farm management, provided by the local FSA representative; another is similarly provided guidance in home management so that the housewife will manage her spending wisely and will get the most, by canning and preserving, from available garden and fruit crops; the third is to promote satisfactory leasing arrangements to the end that the borrower, who is usually a tenant, can be assured of a longer tenure on the farm.

Tenant farmers are growing in number at the rate of 40,000 a year. One tenant out of three moves each year, with resulting gradual impoverishment of the tenants, the land, and the landlords. Our civilization will lose a precious and essential foundation stone if those who work the land lose the ownership of it. The Department has been empowered to deal with the problem experimentally in various ways. For example, it promotes farm ownership by the operators through the Farm Credit Administration, which supervises the work of the Federal Land Banks. In making new loans, the Federal Land Banks advance as much as 50 percent of the appraised value of the farm, plus 20 percent of the appraised value of the improvements. Loans are for 33 years or less, and bear interest at rates much lower than those of former times.

Another attack on the tenancy problem through credit goes forward under Title I of the Bankhead-Jones Act. Under this measure the Farm Security Administration is the action agency; it makes loans to tenants, croppers, and farm laborers so that they may buy farms. The loans bear interest at 3 percent and run for 40 years; they may amount to 100 percent of the value of the farm. Committees of local people approve each loan on the basis of the character, ability, and experience of the applicant. Farms purchased in this way must not be larger than the farmer can handle with his own labor and that of his family. Borrowers agree to follow farm plans worked out with the local FSA representative.

## Land and Water Policies Fuse

Land policies fuse with water policies of the Government in a necessary relationship long ago recognized. Land under irrigation in the West draws most of its water from snow and rain that fall in forests. Water supplies for our cities come largely from forested lands. Erosion control is both a land and a water problem. Congress recognized the relationship in establishing the national forests, and in other measures for watershed protection, and in the Weeks Forest Purchase Law which authorizes the Secretary of Agriculture to take certain steps toward "regulating the flow of navigable

streams." It did so again in the Clarke-McNary Act of 1924 which charges the Department to purchase forest, cut-over and denuded lands "chiefly valuable for stream flow protection."

Other mandates of the Congress to the Department affirmed the essential unity of land and water policies. The Soil Conservation and Domestic Allotment Act of 1936 ranked flood control among its objectives. The Flood Control Act of 1936 declares that Federal investigations and improvements of rivers and other waterways for flood control and allied purposes shall be under the jurisdiction of and shall be prosecuted by the War Department, and Federal investigations of watersheds and measures for run-off and water-flow retardation and soil-erosion prevention on watersheds shall be under the jurisdiction of and shall be prosecuted by the Department of Agriculture.

Especially in the arid and semiarid regions of the West is the use of land dependent on the supply of water. Often the lack of a water facility or facilities is the main impediment to land use readjustment. Congress passed the Water Facilities Act to help farmers meet this need. This act applies to critical areas in the arid and semiarid parts of the 17 Western States. The Department provides credit and technical assistance necessary to planning and constructing facilities whenever such installations can help the farmer improve his income and make a better use of land in harmony with the long-time natural requirements.

## LAND LEGISLATION OF STATE GOVERNMENTS

Everyone interested in land use policy knows that a well-rounded program requires more than simply national legislation. It needs the support also of State legislation and of action by county governments, soil conservation districts, water control districts, and the like. In the last 8 years the national legislature has provided for the Agricultural Adjustment Administration, the Soil Conservation Service, the Farm Security Administration, the Grazing Service, the Rural Electrification Administration, and the program for flood-control work on watersheds. It has continued and strengthened the work of the Forest Service, of land use research units in this Department, and of the Bureau of Reclamation in the Department of the Interior. Action in the States and counties and in other local units of government has complemented the Federal program in many important respects; but the field open for State and local action in land use policy is still very wide. What has been done in it already throws light on the shape and extent of the remaining opportunity.

Our 48 States include more than a dozen distinct major type-of-farming areas, within which we can locate more than 100 well-defined subregions. Bringing the different lands into the best available uses requires many different techniques, some of which require legal action that is not within the Federal jurisdiction. It imposes duties also on the States. Yet even if all the State governments adopted appropriate legislation, the job would not be finished. It would leave much to be done by local agencies. Ultimately the task involves jointly all three levels of government—Federal, State, and local. The success

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of programs on each of these levels affects the success of programs on the others. Fortunately, the States and the local units of government have been active in recent years in meeting their share of the responsibility, though there is still much that they can do. Especially desirable is some means of pooling the experience developed by State and local governments in their land use programs, and of promoting more widespread adoption of the best devices.

It will be useful to glance at some recent State contributions to our land use policy. California has contributed much to the development of the law of water rights and to the legal basis of county planning and zoning. Wisconsin has pioneered in rural zoning and in forest-crop law. Ground-water legislation adopted in New Mexico may become model legislation for other States. In Ohio the legislature has enacted a forest tax law and a law which authorizes the State to acquire chronically tax-delinquent lands and put them in conservational uses. In Tennessee several enabling acts for county zoning have been adopted, and also legislation to facilitate county consolidation.

In Kentucky the Governor has appointed a committee to study farm tenancy, and the legislature has passed a county-zoning-enabling act. Pennsylvania has adopted a county-planning and zoning law. North Dakota has adopted legislation to aid in the reorganization of county government and also a grazing-association law. South Dakota has adopted a county land-management act and a grazing-association law. Legislation has been introduced into the legislature of Oklahoma to improve landlord-tenant relationships in agriculture. In New York the legislature has authorized new methods of administering tax-reverted lands in forest areas, and has authorized counties to use a streamlined procedure in foreclosing delinquent tax liens. The Kansas legislative council is at work on legislation to divert submarginal croplands to grass. Colorado has a planning and zoning act.

Georgia has enabled several of its counties to adopt rural zoning Arkansas is studying landlord-tenant relationships. Missouri has established a conservation commission. Montana has adopted a grass-conservation act as well as legislation to improve the administration of county lands. The forest-tree exemption law of Connecticut is a significant milepost. The Governor of Iowa has appointed a farm tenancy commission.

The legislature of Maine has provided for the economic organization and financing of government in the unorganized territory of the State. Michigan has authorized rural zoning and improvements in the administration of tax-delinquent lands. Minnesota has a rural-zoning law and new methods of acquiring State tax titles. North Carolina has revised its tax-collection procedures. Oregon has a reforestation law and a recent statute facilitating school-district reorganization. Indiana has a county planning and zoning act and a law authorizing the State Department of Conservation to acquire and utilize tax-delinquent lands. As previously mentioned, 42 States within the last 5 years have adopted soil-conservation district laws patterned in most cases after a Standard State Soil Conservation Districts Law cooperatively worked out by this Department and representatives of various State agencies.

## Wide Scope Remains for State Action

Considerably more State legislation and State administration in land use could be usefully undertaken. This is not to say that the Federal Government is doing too much. Many and perhaps most of the problems of agriculture require Federal as well as State action. Strong national legislation and large national appropriations for helping agriculture are indispensable. But the field that should be occupied by State legislatures and State administrative agencies is very large and State laws of the types above mentioned do not exhaust the opportunity.

Wider adoption of State legislation to authorize rural zoning ordinances is highly desirable. Comprehensive rural-zoning-enabling acts are in force in only eight States: California, Colorado, Michigan, Pennsylvania, Virginia, Washington, Wisconsin, and Indiana. Seven other States have conferred a limited rural-zoning power on selected counties. In the New England States, except Vermont, rural zoning has been authorized for townships. Some of the existing rural-zoning-enabling acts lack clarity; others provide inadequate administrative machinery or do not ensure democratic control of the zoning process. Others contain inadequate enforcement provisions. Rural zoning is of course not equally important or valuable in every part of the country. But it would be useful in many States that do not have it, particularly in areas where it is important to prevent new agricultural settlement in submarginal land.

What has been done by State legislatures to facilitate the public acquisition of tax-delinquent lands is only a beginning. Every State has some sort of legislation on this subject, which sets up a procedure for determining what lands are delinquent, how the public shall acquire title to lands forfeited, what the period and the conditions shall be for the redemption of such lands by the former owners, and what public agency shall administer the lands that are not redeemed. In most States, however, the meaning of the statutes and of related court decisions is obscure. Sometimes no one knows precisely when lands may be offered for tax sale, or precisely when the right of redemption lapses. There may be doubt as to what agency should administer unredeemed lands. Some States do not designate the most appropriate agency for this purpose. Few States provide against the resale of tax-forfeited lands that are not capable of being well handled in private operation.

In some States investigators have pointed to the need of some sort of State land-development and land-management agency. The purpose of such an agency would be to survey and classify the lands that come into public ownership, whether through tax delinquency or any other involuntary process. It would be then able to suggest and perhaps to decide what lands should be offered for resale and what lands should be retained in public ownership. This is often a very difficult question. Tax delinquency results sometimes from the overcapitalization of lands, or from excessive or maladjusted tax burdens, rather than from actual deficiencies in the soil. It is not invariably a sign that land should be transferred from private to public uses. Generally, nevertheless, tax delinquency is an evidence that successful private operation is difficult under the prevailing conditions, and may

require treatment along with other land use questions through some unified State land-development and land-management agency.

### Rights of Landlords and Tenants

Many State legislatures are taking up the question of legislation as to the mutual rights and obligations of farm landlords and farm tenants. This matter, largely in State jurisdiction, has a vital bearing on both Federal and local action in land use policy. It affects the national agricultural policy, for example, in the influence it has on the effective participation of farm tenants in crop-adjustment and soil-conservation programs. It affects local government through the bad results of tenant insecurity on farm-land values and tax revenues. State legislation that required farm leases to be in writing would help greatly. The added requirement that farm leases should run for at least 2 years would be enormously valuable. As is well known, an immense number of tenant farmers shift annually from farm to farm, at great cost to themselves, to the landlords, to the soil, and to the community. Some State legislatures are studying the possibility of giving farm tenants a right to some compensation when the landlord refuses to renew the lease, for the value of any unexhausted farm improvements that the tenants may have made at their own expense. This is desirable, not only out of fairness to the tenants, but as giving tenants an inducement to make needed improvements.

### Local Units of Government

Another important State and local problem that has a profound effect on our land use system is the form and number of our local units of government. In the United States we have something like 127,000 school districts, 21,000 towns and townships, 16,000 unincorporated places, and 9,000 special local units of government of other kinds. In all we have no less than 175,000 units of government operating in our country. The boundaries frequently overlap. Nearly all of them have the power to levy taxes and issue bonds. Though we have a great multiplicity of units of government, we lack certain necessary kinds. Many of our metropolitan areas, for example, have no single unit of government for the area as a whole.

Some States are already tackling this tremendous problem. The North Dakota Legislature, for example, adopted in 1939 a special statutory procedure under which a county may become an unorganized area and may become attached to an adjacent county for certain minimum government necessities. This procedure is desirable where a particular county has too few or too poor a population to support the general range of county governmental expenses.

Still another field open to State land use legislation concerns proper forest practices on privately owned forest lands. There is a field for State legislation also with regard to administrative procedures for the acquisition and disposal of rights to the use of water. This last type of legislation is of special significance in the West. As yet only New Mexico has a reasonably adequate law to regulate the use of underground waters, though the problem of conservation of ground waters is crucial in 17 Western States.

### Problems Common to Most States

In rural-zoning and in tax-delinquency statutes, in the better management of State lands, in promoting better landlord-tenant relationships on the farm, in the reorganization of local units of Government, and in promoting the conservational use of soil, of forests, and of water, all the States have an interest. Certain other problems are acute in particular States, such as the regulation of oil exploitation, of land drainage, and of water pollution. Action must rest, however, on cooperative study of the administrative, policy, constitutional, and legal problems involved. There is need for the contribution of experts in agriculture, in law, in taxation, in public administration, and in economics and sociology. In most States the Extension Service and the Experiment Stations have issued bulletins dealing with separate land use problems. They have not yet been fully studied as a whole from the legal and administrative standpoint, though an interbureau committee of this Department issued a report on the subject last April. The report said the outstanding need is a closer integration of Federal, State, and local action.

The combinations in which the problems of erosion, of floods, of submarginal lands, of isolated settlement, of low farm income, and of human maladjustment present themselves vary from State to State and from locality to locality. In some areas the whole set may coexist. In other areas only one or two of the main difficulties may appear. No two parts of the country will have exactly the same combination of problems. Everywhere, nevertheless, the attack will rest on the same principles. It will involve the same fundamental plan. Reasons both of law and of convenience oblige legislatures and courts to treat rural zoning, erosion control, flood control, tax delinquency, land settlement, and other questions of land policy as separate subjects. Action agencies of the Federal, State, and local governments, however, have to deal with all these matters at once. They have to treat them as aspects of the total land use problem, the total handling of which is the joint responsibility of Federal, State, and local agencies.

## CONSERVATION IN DEFENSE AND POST-DEFENSE PLANNING

In the present emergency it is imperative, on the one hand, that the national farm plant be placed on the most efficient basis possible. Farm commodities must be produced with a minimum of fertilizer, new equipment, and labor in order that all possible materials and manpower can be released for use in industry and in the military forces.

On the other hand, agriculture must prepare for the period following the war, during which a great strain will be placed on the national economy as defense spending and military production cease and the armed forces are demobilized. Everything possible must be done to prevent paralysis of business activity and unemployment. Looking ahead, this means that agriculture must be ready to absorb large numbers of people who may be thrown out of work and demobilized

from the Army in the midst of a severe contraction of markets for agricultural products.

While the objectives of the war period and the period following the war will necessarily be somewhat at variance, the soil and water conservation program of the Department of Agriculture will play a vital role in adjusting agriculture to meet both needs. Work already done will prove of inestimable value. At the same time it is essential that we push forward and protect as much of our farm land as possible before the impact of post-war derangement strikes.

Experience shows that after every period of great industrial activity thousands of families return to the land for subsistence when urban jobs become scarce and wages fall. Perhaps the movement will be less than usual in the next depression. But we cannot count on that. There will be a place for some of the land seekers; others will not find productive land. The available better lands will be taken quickly. Little will remain but cut-over areas and poorly drained lands difficult to bring into cultivation and often of low productivity. The conservation facilities of the Department will be called on to play a leading role in fitting these people into agriculture.

## Soil Losses Involve Huge Costs

The soil loss that already has taken place and the slowly ebbing strength of our land may not seem gravely important in a casual view. What erosion costs must be appraised in its bearing on crop yields, migration, farm abandonment, rural poverty, tax delinquency, the shoaling of streams, the silting of waterworks and channels, increased run-off and mounting floods, and damage to highways, railways, wildlife, and health. The appraisal is difficult. Even a beginning in it, however, shows that the total costs must be enormous. Erosion has made its devastating inroads in this country largely within the space of a hundred years. No nation or race, civilized or barbaric, has wasted productive land faster. It is a plain, measurable fact that we cannot afford to lose any more of our soil wealth. In some parts of the country farmers are already obliged to seek out and till small scraps of land.

We cannot afford to relax our efforts to protect the soil. Nor can we afford another costly plow-up of all kinds of lands without regard to its suitability for cultivation. Indeed, we must look further ahead than ever before and plan for the future. To reverse the trend of exploitation will require a major effort. Our conservation programs have slowed it, but much remains to be done—in fact the larger share of the job. Early American soil exploitation built a mighty nation from the wealth nature had stored through countless ages. We must be equally efficient now in conservation. We shall have to change our ideas about the land.

No amount of work will completely repair the damage that has been done. It is a practical possibility, however, to turn the tide away from exploitation and in the direction of conservation within the next 15 or 20 years. Conservation is steadily adding to the fast-developing efficiency of the American farm. Agricultural science has allied itself more closely than ever before with this effort. The long-neglected raw materials of farm production—the soil and

water—now occupy a substantial share of the attention of our scientists.

Variations in the productivity, adaptability, and needs of American land types are being studied and analyzed. Some types of land, for instance, are well adapted to wheat production, seeded on the contour; others are not suited for wheat at all, but produce excellent pasturage. Other types are well adapted to corn, or cantaloupes, or peas; still others are best suited to grazing or to forestry. In some places the land washes away quickly; in others it blows away with almost equal speed. Locally, the soil may be rich, but too wet for practical use. Or it may be too dry for regular cropping. In many localities erosion has sapped the productivity of the soil.

As an important part of the conservation program, the Department is classifying farm and range land so that eventually we will be able to ascertain quickly the precise areas where, in case of emergency, we can expand or contract farm production most efficiently. As we learn the capabilities of our soil resources for varying uses, we can partially eliminate the chances for waste of manpower, fuel, seed, and equipment on inefficient acres. Similarly, we can diminish the likelihood of ill-advised, indiscriminate plow-ups such as took place during and after World War I.

## Land-Use-Capability Maps

The facts about America's land resources are being assembled by the Soil Conservation Service on "land-use-capability" maps. With one of these maps, a farmer can determine almost at a glance which areas are best for intertilled crops, where his best pasture land is, where his poorest acres are located, and which land is best suited for grass and trees. On the maps, the very best lands for safe, efficient production are colored green. The next classification is colored yellow. When a farmer sees part of his land colored pink on the map, he knows at once that terracing or strip-cropping or some other measures of soil protection are needed there. "Blue" land is "not suitable for continuous cultivation"; it should be plowed only once in a great while. Lands colored light brown on these land-use-capability charts are not suitable for cultivation under any circumstances; they need grass and trees permanently because they are too steep, too rocky, too poor, or too eroded for safe crop production.

Mobile survey parties, with large-scale aerial photographs as base maps, make this land analysis and inventory, field by field, across the country. This is a relatively slow and painstaking job; it requires scientific knowledge of soils, erosion, topography, climate, and many other factors in their relation to crop production. The capability maps have been completed for more than 90 million acres.

Even beyond its value in times of emergency, this new kind of information about the land is being welcomed by farmers who are using it to plan their normal operations more efficiently. Modern conservation farming and ranching, based on a factual analysis and inventory by science of the basic materials of agricultural production, is more efficient that the traditional type of farming and offers immeasurably greater security and long life to the American farm plant.

Another of the big jobs now being undertaken by science to make

agriculture more efficient is to find better ways of trapping rain water where it falls, so that it will sink deeply into the ground and nourish crops instead of rushing off to cut gullies and add to flood waters. Engineers of the Soil Conservation Service have about solved this problem, and farmers are now building a new, efficient, streamlined type of terrace that holds water, does not interfere with crop production, and is relatively inexpensive to construct.

### Tillage by Conservational Methods

More and more farmers—particularly in soil conservation districts—are plowing along the contour of the land instead of in straight rows, so that every plow furrow will catch and hold water that tries to run downhill. More farmers are rearranging the location of their crops on their farms, in conformity with the capabilities of their soils, so that the crops themselves will help hold soil and water. Because they are more efficient and because they recognize the limitations imposed by nature on the use of land, measures of this kind are bringing results.

Take, for example, the famed Palouse region in the Pacific Northwest, a land richly endowed with fertile soil if there was ever one. For years this area has been one of the granaries of the New World; it has poured forth millions of bushels of wheat with unfailing regularity. But erosion gradually took its toll. Fifty crops of wheat permitted the soil to wash from many of the rounded hilltops of the Palouse down into the valleys. Yields on the upper lands began to go down. Many acres failed to show a profit.

From most of the sloping ground there was evidence of some soil loss, which varied with the length and steepness of the fields. The yields from land suffering different degrees of erosion damage were measured. It was found that the deep topsoil on the lower slopes produced about 50 bushels to the acre, while the hilltops produced only 14 bushels. It was then computed that 75 percent of the total wheat acreage produced 85 percent of the crop, at 65 percent of the farming cost. This meant that, while most of the wheat was produced on the good lands, wheat production on the poorer lands was definitely unprofitable.

So, with the cooperation of the wheat farmers of the Palouse, soil conservation technicians began taking these worn, unproductive acres out of wheat and putting them to less intensive use—to grass, alfalfa, sweetclover. It turned out that these hill crests and steep slopes were worth more in forage crops than they had been in wheat. Equally important, these dense-growing crops held the soil in place and kept the run-off from damaging the cultivated fields. When the harvest is in, the meager yields from these injured acres are hardly missed from the total amount of wheat for market. But when the cost of the year's operations is counted up, there is a noticeable saving.

That illustrates efficiency in the use of land—the kind of efficiency that will serve as well in times of war as in times of peace.

## CONTROL OF FLOODS BY LAND TREATMENTS

In recent years the severer floods have been increasing in number, especially in watersheds where land deterioration has become acute.

The flood of May 1941 in the Rio Grande Valley, though it discharged only 22,000 cubic feet per second near Albuquerque, inundated some 25,000 acres of productive irrigated lands between Socorro and San Marcial, N. Mex. It caused damages out of all proportion to the volume of the floodwater. The flood of September 1929 produced at its peak twice as great a flow; yet it covered only half as much land.

Through long misuse of the uplands, channels have now become choked with sediment and the beds built up so that even minor floods spread out over large areas of valuable irrigated lands. The area endangered by future floods in this portion of the Rio Grande Valley may exceed 50,000 acres. The natural balance has been upset so much that years will be required to restore it even with good land management. Channel improvements and other engineering work combined with proper range and forest practices on the uplands are essential to the future of this valley.

Culture practices cannot by themselves prevent flood damage. The control of "superfloods," or even of the larger, more frequent floods, is not within the power of agriculture alone. It is also a big problem in downstream engineering. Engineering structures, where they are feasible, are often very effective in providing immediate flood protection. But they do not meet the fundamental problem of maintaining satisfactory soil and water conditions on the uplands where the floods begin. This is a problem that includes land treatment as well as water-control measures.

Complete flood-protection programs require engineering and land-treatment measures together. They regard watersheds as indivisible units, and look toward the control of floodwaters and of silt at the sources as well as in the channels of the valleys.

This Department's flood-control program rests squarely on that basis. It complements downstream engineering as a means of lessening the destructive effects of floods. Surveys under many conditions of climate, soil, and land use guide the development of specific watershed projects, agriculture's part in which is very important.

It includes first the power of the soil to hold and store flood-producing rains. There is a fairly definite limit to that; it varies with the depth and character of the soil layers. Often, however, the surface layer and its plant cover have degenerated through mismanagement, so that this natural storage reservoir cannot function properly. Agriculture can help to rebuild and even to enlarge this reservoir by measures which at the same time will make the land permanently more productive.

The application of soil and cover improvements on cultivated, range, pasture, and forest lands, along with necessary minor engineering works and with balanced farming, ranching, and forestry, is the means whereby this can be done.

Largely, the program must be applied to privately owned crop, forage, and timberlands. How effective it will be depends greatly on the willingness and the ability of owners and operators to accept their responsibility. Without their support, the program will be handicapped. Where damage in flood plains results clearly in part from misuse of uplands whose operators lack the incentive or the means to undertake protective measures, it will be necessary for the Government to come to their assistance with funds and other facilities.

## Appraisal of Benefits

How much benefit we get downstream from work done upstream is a question no one can precisely answer. No long experience, no mass of scientific knowledge, has yet been assembled. With specific inquiry we cannot know by how much the treatment of a given watershed will reduce the amount and height of floodwaters. There is no point in snap judgments, even by the most competent scientists. Appraisal of product values, such as trees or crops, that come from better land use management, is less difficult. It has a basis in previous experience and knowledge. But appraisal of flood benefits is a different matter. Yet we have reliable rough proofs that proper treatment of land is often a flood lessener if not always a flood preventive.

It is not difficult, for example, to determine how much water or soil runs off a sample plot or tiny watershed. Such studies provide essential information on how water behaves under specific, controlled conditions. True, we have to be cautious in applying the results of laboratory-scale tests to the actual conditions on large watersheds within which climate, soil, and land use may vary greatly. Yet small-scale findings warrant some inferences as to possible results on a large-scale basis and broadly the inferences are encouraging.

As with every other science, flood control must undergo a period of testing and refinement. The Department's task is to develop the best possible measures and make reasonably sound estimates of their benefits. It must build a storehouse of practical knowledge to guide both public and private effort and expenditure. It is to be expected that the flood-control program will pass through a period of trial and error.

This is reflected in the results of the past year. New hydrologic knowledge has revealed that some measures formerly thought to have considerable flood-reduction value are at best of partial value. New measures and improvements in old measures are being tested. There is growing knowledge of how they contribute to flood and sediment reduction, how they increase the amount of water stored in the soil, and how they decrease soil losses. Procedures for estimating annual crop losses caused by floods are being refined; also procedures for determining more closely the relation of physical conditions and cultural practices to floods. In the Trinity River watershed in Texas, for example, hydrologic investigations and careful analysis of the findings have furnished a much improved basis for estimating the benefits expected from the land use program recommended.

Flood-control work produces a combination of benefits. There is soil and water conservation on the land treated, and flood protection on the valley lands below. Occasionally, indeed, ordinary soil and water conservation provides considerable flood control as a byproduct. But conservation practices cannot of themselves, in all cases, produce the full flood protection desired; if they could, there would be no need for a separate flood-control program. In many areas the ordinary, profitable land use practices would not provide sufficient flood benefits if they were in use on every piece of land. In still other areas crop and other returns to upland owners are so meager or uncertain, and on the other hand, the need of flood control is so vital, that Federal financing to meet the cost of the special structures and intensive practices and measures is absolutely indispensable.

## The Defense Aspect

Flood control through land treatment can serve the national defense, particularly in watersheds where defense industries are located. In southern California, in other parts of the Western States, and in certain parts of the East, even slight disturbances of the soil or vegetation may cause calamitous discharges of debris or sediment. Such discharges may interfere seriously with defense production. The Los Angeles metropolitan district, with its airplane plants and other key defense units, lies directly in the path of mountain torrents.

Both the War Department and the Department of Agriculture are doing work to avert the danger. This Department is active in the Arroyo Seco and San Fernando Valley portions of the Los Angeles watershed. The total treatment in the Arroyo Seco unit involves the construction of fire-prevention and fire-suppression facilities, the seeding of burned areas, mountain channel improvement, and the stabilization of mountain road banks by engineering and planting measures. In the San Fernando Valley the program includes improved cropping methods, planting of cover crops, crop rotation, terracing, basin listing, and better irrigation practicess. The Department is encouraging good pasture and woodland management, and retiring unsuitable land from cultivation. Debris basins are being constructed at the mouths of mountain canyons, and minor channel improvements made on the flood plain. Estimated benefits for the Los Angeles watershed as a whole are nearly twice the cost.

Temporary flood control can be had quickly and effectively in some areas with simple, low-cost measures. An example is the emergency Keenbrook flood-control project recently completed on the Santa Ana watershed in southern California. Fire swept this area of 9,500 acres in August 1940. Experience indicated that winter rains might cause large amounts of debris to move on to valuable lands in the valley below. This menace was averted by sowing a quick cover crop, by clearing mountain channels, and by building simple debris basins and dikes. This work, which involved a relatively small expenditure of flood-control funds, minimized the effects of unusually heavy storms that occurred soon afterward.

Industries that manufacture or assemble defense products are exposed to floods in the Connecticut and Ohio Valleys, in the Southeast, and in the Trinity River Valley. However desirable it is to avoid locating plants in flood-hazard zones, the fact remains that many are there. As defense preparations continue, more plants will probably be located in areas subject to flooding. Agriculture can help with flood-control work quickly enough in some cases to meet the problem during the defense period; and in other areas quickly enough to aid materially in post-war adjustments.

Owners and operators of watershed lands are rapidly coming to see their responsibility. In some areas the public interest in watershed management is paramount. It requires difficult and costly methods that only direct public action can provide. In other areas the nature of the task is such that joint public and private efforts are necessary. Over most of the United States, however, the largest share of the responsibility and effort will continue to be borne by individuals and groups. Broadly, the task is cooperative; it draws on Federal, State,

and local public agencies, and also on the knowledge, initiative, and public spirit of land operators.

## SHORTAGE OF FARMS TO RENT

In many once stable communities, tenant farmers have had to give up farms which they had operated for many years, and an increasing number of them have not been able to find other farms where they can continue farming.

We have become accustomed to shifting tenantry in the South, to the migration of farm people from the Dust Bowl, and to the wandering of seasonal laborers from harvest to harvest and from place to place, but only recently have we experienced the displacement of once stable tenant farmers from family-sized farms in the Corn Belt and other rich agricultural areas.

Formerly when a reputable tenant could not secure the renewal of his lease, he could easily find another acceptable farm to rent. Now, however, reports coming to the Department of Agriculture from many sections of the country indicate that this is no longer true.

### The Present Situation

In 1940 there were 200,000 fewer farms in the United States than there had been in 1930, and tenant farms alone decreased over 300,000.

Some of the farms lost were small and unproductive. They could not furnish the farm family with an adequate living and should have been combined with other farms. Reports indicate, however, that consolidations are occurring not only or even primarily in areas where farms are too small and where consolidation is needed. In fact, the opposite appears to be happening: Subdivision is taking place in the small-farm, poor-land areas and consolidation is most common in areas where farms already large are being made still larger.

In the humid areas of North and South Dakota, where consolidation is not necessary to create efficient farming units, farms are being enlarged. Between 1930 and 1940 in Ohio, Indiana, Illinois, and Iowa more than 16,000 farms having between 100 and 259 acres of farm land disappeared as a result of realignment of land holdings; and during this same period, these States saw the creation of more than 7,000 new farms having between 260 and 999 acres of farm land. Doubtless some of the farms between 100 and 259 acres needed enlargement to make them efficient units, but many others were adequate family-sized farms, and, as a result of their absorption into still larger farms, many tenant farmers who are skilled agriculturalists with long successful farming experience and good financial backing have been displaced.

The total number of farmers displaced is not known, but reasonably good estimates for Iowa indicate that approximately 20 farmers per county, or 2,000 in the State, were without farms last year. The amount of land involved in these changes in control—of which displacement is one aspect—was even more significant than the number of farmers. Land in farms of 500 or more acres increased by more than 370,000 acres between 1930 and 1940; most of it came from smaller farms absorbed by consolidation. If this land were divided into farms equal in size to the average Iowa farm, that is to say,

farms of 160 acres, more than 2,000 additional farms could be established, and 2,000 additional farms would provide all of the displaced tenants with places to live and work. If the entire 1,800,000 acres of Iowa land in farms of 500 acres or more were divided into farms of 240 acres, the number of farms in the State could be increased by more than 3,700.

## Forces at Work

Consolidation of holdings is not a new phenomenon. The introduction of tractors and other machinery during World War I and after made possible the operation of more land with less labor, and consolidation of land holdings resulted. They have continued and become more common with the development of larger and more efficient machines and the consequent reduction of labor requirements per unit of production until at present there is no denying the increasing rate at which farm consolidation is occurring and the serious problems which it has created.

To the influence of mechanization has recently been added the incentive to divert land from soil-depleting, labor-consuming row crops to soil-conserving, labor-saving systems of land use. Farmers have found that without increasing either their labor force or their equipment they can cultivate more land and so have an additional incentive to acquire more.

In some areas business men and other nonfarm people have turned to farming as a hobby or as an investment. They have acquired separate parcels of land and have combined them into larger farming units. As a result, many tenant farmers in the Corn Belt have been displaced.

In suburban areas, estates have absorbed large tracts once operated by farmers, some of them tenants. In sections where the land is not valuable for farming purposes (for example, in the hill sections of Vermont, New Hampshire, and Connecticut) the consequences have not been important, but where valuable farm land is being taken out of agricultural use (as around cities like Chicago, St. Louis, and Kansas City) the effect has been to displace farmers some of whom have no doubt been tenants.

The general extension of the boundaries of cities as part of the process of industrialization and urbanization has, of course, absorbed additional land, some of it rich farm land, and further contracted the supply of land available to farmers.

Recently large tracts of farm land have been acquired for military reservations and other defense activities. Much of the land taken for these purposes was in farms, and the farmers who operated it have been compelled to seek farms elsewhere, sometimes without success.

Some of the largest landowning insurance companies are realizing a higher rate of return from rents on foreclosed farms than from their investments in farm mortgages. Competitive forces, partly engendered by Government-sponsored lending agencies, have prevented undue increases in the interest rates on farm mortgage loans, but rental rates have risen greatly as a result of the keen competition for farms to rent. There is, therefore, an incentive to hold foreclosed farms rather than to dispose of them through resale. Institutional lending agencies, of course, wish to manage their land

efficiently, and they often find it economical to reduce the number of operating units into which their land is divided. Their agents are constantly seeking tenants on adjacent or nearby farms who will offer the highest rentals, consolidating operations under these tenants, and displacing other tenants whose equipment and stock do not permit large-scale operation.

These are some of the contemporary forces contributing to the shortage of farms.

## Economic and Social Implications

Partly as a result of this decrease in the number of farms, there have been more farmers wanting to rent farms than there have been farms to rent. In such a market, the competition for farms is keen and tends to drive up both sale prices and rents. Some farmers have bought farms—often at prices too high or on terms unfavorable to the purchaser; others have contracted to pay excessively high rents. In either case sacrifices in living standards, deterioration of machinery and equipment, and "soil mining" instead of good farming are apt to result.

Some farmers have rented farms entirely too small for their machinery and livestock and incommensurate with their managerial ability in order to have a place to live. Still others have sold their equipment and taken work as farm laborers; many of them, especially the migrants, have all but lost their place in agriculture.

Finally some former tenant farmers have found temporary refuge in nonfarm work made plentiful by the National Defense Program.

When the emergency has passed, unless there are wisely conceived, carefully planned, and efficiently administered programs for implementing the transition from a war economy to a peace economy, contraction in industrial activity, urban unemployment, and the other ills of the early 1930's may recur and aggravate distress and instability in agriculture.

Whenever charges on farm land, whether for interest and amortization, or for rent, are more than the productive capacity of the soil can support without exploitation, both human and soil erosion result. The farmer must, first, mine the land to maximize shortrun returns, and, second, he must reduce his standard of living. Eroded fields, dilapidated buildings, run-down fences, and worn-out machinery reflect exploitative farming. Improper food, inadequate clothing, poor housing, poor health, and inefficient labor reflect the toll on human life.

The physical deterioration that results from the lack of food, shelter, and clothing is bad enough but hardly worse than the effect of insecurity upon the spirit. Relief, though necessary, is not enough. Relief will not maintain faith in democracy. There is no panacea for the problems associated with the displacement of tenants, but continued action along the whole front can lessen displacement, and alleviate its effects when it occurs.

## Possible Adjustments

The tenant-purchase program to make farm owners out of tenants is being expanded to the limits of the available resources, but as yet

only a beginning has been made. Adjustments and improvements in it may make it more effective.

Credit facilities may be used to help lessen the displacement rate. Farms acquired by lending agencies through foreclosure can be resold in such a way as to maintain family-sized units. Tracts that are too small for economical operation can be sold to build up units that are now undersized. On the other hand, tracts that are larger than necessary can be divided. It has been suggested that credit could be provided to prospective owner-operators at a lower rate than to persons who buy farms for investment or for speculation; and that lower rates be accorded to purchasers of family-sized units than to purchasers of larger farms.

Many State Governments own land which could be farmed. Procedures could be devised to insure its division into family-sized units and the preservation of units of this size. In addition, the Federal and State Governments might regulate the agricultural use of land in public ownership so that it will be operated in family-sized units. Planning of reclamation and drainage projects, so that new farm land will be distributed and maintained in family-sized units, would help.

Displacement will be reduced by all steps that help farm owners to avoid foreclosure or bankruptcy and hence to avoid being forced into the tenant group which, because of its insecure tenure, is the group most subject to displacement. Flexible mortgage payments in place of the present fixed annual charges would be beneficial. Adjustments in farm mortgages and foreclosure procedures would help in periods of stress. Continued activity of debt-adjustment committees, possibly with additional powers granted under State legislation, would be effective.

Adjustments in the property-tax system have been suggested as a means of aiding owners to keep their farms. Some 20 States have homestead-exemption laws, which provide for tax exemptions or differential rates of taxation in favor of home-owning farmers. Many of these laws, however, do not provide for sufficiently large differentials; some of them have other weaknesses that could be remedied. The exemption of homesteads in more States and the development of more effective homestead exemption laws would facilitate maintenance of family-sized farms by owner-operators.

Should law-making bodies consider it desirable, they could use the taxing power in other ways to further these objectives. For example, a capital gains tax might be imposed to promote and protect family-size owner-operated farms by discouraging speculation. Taxation might also be used to discourage concentration of control in land; taxes might be graduated according to the size of land holdings so as to discourage the operation of excessively large units. Suggestions like these, however, involve questions of constitutionality as well as of broad public policy.

There has been much discussion recently of rent-control programs in cities affected by the defense program. If a general price-control program is undertaken, it may be necessary to give consideration to the control of farm rentals. A scheme for rural-rent control, however, would have to be worked out very carefully to make sure that it would not encourage the displacement of tenants by making the operation of farms more profitable by the use of hired labor.

Farmer cooperatives for the ownership and use of machinery, equipment, and livestock can help to preserve the family-size farm. The Farm Security Administration has successfully organized and operated cooperatives of this nature. Members can obtain the use of modern machinery without having to purchase it individually. More production on the farm for home consumption can help to maintain family-size farms. Live-at-home programs may enable many small farmers to compete more successfully with large operators.

## LAND VALUES AND LAND SPECULATION

Current farm-real-estate market conditions appear basically to be in a more economically sound position in several respects than has been the case since before the last World War. Land values since 1933 have been recovering in a reasonable and sensible fashion. By 1937 values had increased 16 percent over the depression low, a rather cautious response to improved agricultural price and income levels. Values for the country as a whole have been more stable since 1937 than for any period of comparable length since the turn of the century. The Department's index of the average value per acre of farm land as of March 1, stood at 85 percent of pre-war in both 1937 and 1938, dropped to 84 in 1939, and advanced again to 85 in 1940 and to 86 in 1941.

Offsetting movements in the different geographic divisions during this period have reduced fluctuations in the average for the country as a whole. However, even here values have moved within fairly narrow ranges, with eight of the nine major geographic divisions reporting changes of less than 6 percent for the 5 years. Again, while there are some evidences of excessive value increases in local areas, values in the principal farming areas are for the most part not above levels that may be carried without undue pressure on living levels under reasonable price and income expectations.

Foreclosure frequencies and related transfers arising out of debt difficulties are lower than they have been in approximately 20 years. Conversely, voluntary sales are more frequent than they have been since the years immediately following the last war. While some of this increased sales activity undoubtedly reflects purchases by nonfarm investors, the basic movement has probably been the passage of farms into more socially desirable hands, since a substantial percentage of the purchasers have been tenants and farmers already owning land.

Lands owned by elderly farmers wishing to retire as well as in estates have found a more ready market. The Federal land banks, the insurance companies, and other unwilling owners have been able to dispose of holdings acquired as the result of foreclosure. While lands held by such groups are still substantial, current developments are definitely in the direction of reducing their land holdings. This results from the marked excess of sales over acquisitions. The number of farms held by the Federal land banks at the middle of 1941 was about one-fifth below the holding a year earlier. Approximately one-four of all properties the banks had for sale during the first 6 months of this year were sold, as compared with about one-fifth for the same period in 1940. In 1940 about one-half of the land-bank sales were to former tenants, a considerable increase over the proportion

sold to tenants in previous years. Transfers to such groups at land prices that may reasonably be met out of income characterize the type of land transfer movement that is socially desirable.

### Explanation of Current Sound Condition

It is not difficult to find an explanation for the economically healthy characteristics of the current farm-real-estate situation. It is traceable in a large measure to farmers' attitudes toward land values considered economically valid. These attitudes in turn may be attributed to a considerable extent to the experiences of the last quarter century. Farmers know a great deal more about land values than they did before or during World War I. For one thing, they now know that land values can and do fall. Perhaps even more important, they know why. In order to continue at given levels, farmers have learned that land values must bear a reasonable relation to farm income. Further, the farm income that is important in determining the validity of land values frequently is not the current income. In order economically to justify value levels as well as fulfill the contractual obligations so frequently associated with ownership, dependence must be placed upon the incomes to be received over an extended period of years. The dangers involved in overemphasizing current-income levels in formulating judgments concerning land-value levels is one of the principal lessons from the last war that has been learned through bitter experience.

Other lessons were also learned, including the evils of rampant speculation in land and the futility of land purchases at prices out of all reason even to current incomes and prices. While speculation and absurd relations to current incomes and prices were significant in areas of pronounced land booms, the general upsurge in values throughout the country was due essentially to overemphasis on current incomes and prices and to failure to appreciate their temporary nature. Too many farms were purchased, mortgages incurred or expanded, and local government obligations voted with valuations based on $2 wheat, 30-cent cotton, $20 hogs, and $15 steers. When these prices toppled, the land-value structure for which they were the foundation crumbled, and it was possible to meet the fixed contractual obligations only through loss of title or reduced levels of living.

Other influences affecting land values which have changed in significant respects should not be overlooked in explaining current farm-land-value attitudes. As a group, farmers see increasingly less justification for sacrificing living levels to support excessive values. Farmers also are more fully aware of the fact that the United States must either be an agricultural exporting nation or contend with serious surplus-producing-capacity problems. The land-value implications of this condition are obvious. Furthermore, farmers now recognize that a high burden of fixed charges results from land-purchase and mortgage contracts and enforces a rigidity that endangers security in a world where economic instability has been the rule rather than the exception.

### Maintenance of Stability Vital

Maintenance during coming years of the economically sound and socially desirable land-purchase and land-price policies currently being

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followed by farmers is an objective worth every effort. It is to be hoped that under the exigencies likely to prevail, farmers will not lose their balanced perspective. For we are again face to face with a situation in which agricultural prices and farm incomes are rising substantially, traceable in a large measure to wartime demands. There is still time to make decisions with respect to the course that land values will follow in response to improved price and income conditions. Farmers can use this increased income to retire debts, to make long-neglected improvements of various types, or to raise living levels; they can use it to expand the size of their operations through the purchase of farms or of additional land. Frequently these are all justifiable uses. However, land purchases and permanent improvements usually involve the use of credit, and here there is always need for caution. The exercise of caution is particularly necessary during the next few years in connection with expansions that involve fixed obligations. A long view in reaching decisions with respect to this type of investment is essential in the interests of future security.

Agriculture has a very definite stake in relatively stable land values at proper levels. In the absence of a reasonable degree of stability in land values, farm security as a goal is likely to be exceedingly difficult if not impossible to achieve. However, stabilization at current levels is not necessarily essential. If during coming years farmers receive prices and incomes that approach parity, values in many of the principal farming areas should and will rise. The important thing is that the value adjustments which occur shall be supported through the maintenance of a fair relationship between values and reasonable farm-income expectations.

Farmers' actions will largely determine the course that values will follow and the choice of courses rests largely with farmers. Without active farmer participation, the activities of the land speculator and the profiteer are doomed to failure. Farmers themselves can thus do much to prevent a recurrence of past experiences. Their efforts in this direction would be aided materially by the strict adherence to sound credit policies by creditor agencies.

If unreasonable increases in land values occur, farmers have alternatives available to land buying. Tenants are not likely to achieve security from purchases at excessive land prices. Under such circumstances they would be better off as tenants. Owners have reason to be cautious in expanding the size of their holdings or in selling the farms they have now with a view to buying other farms. In the interests of future security, debt retirement frequently constitutes an excellent alternative for the use of increased incomes.

## FARM CREDIT PROBLEMS

This war, like all major wars, threatens to cause violent price fluctuations and serious problems in agricultural credit. Such problems have serious consequences to farmers and the whole economy. We must try to soften their effects before it is too late.

The general level of wholesale commodity prices is rising. Farm products are higher—a deserved increase in the light of the farm handicaps of the past decade; for years farm crop prices have been too low.

But our primary concern must be to have a better balanced agriculture with the higher prices. We must guard against letting rising farm incomes become once more an instrument for the overcapitalization of agriculture and an undue expansion of farm debts.

There is evidence already that some lenders to agriculture are inclined to lend more than normal values warrant. Signs point to a rise in the market for farm real estate. Lenders report that farm sales in some places in the first half of this year exceeded those of the first six months of 1940 by 25 to 50 percent. Gains in the dollar volume of farm sales by some lending institutions during the first half of 1941 ran as high as 85 percent above the same months in 1940.

In the first World War farm prices (and the index for all commodity prices) more than doubled in 5 years. A sustained rise in commodity prices soon finds expression in higher prices for land and heavier debts on farms. Heavy increases in farm debt may develop out of the present situation if we are not careful.

Inflated prices on land values result invariably in large increases in long-and-short-term borrowing. Sustained rising prices bring about higher costs and higher capitalization of the existing agricultural plant, and bring in additional marginal producers and marginal acres. The net effect is heightened competition among farmers, which in the usual ensuing period of price declines make a bad situation for farmers and lenders.

Between 1914 and 1920, commodity prices, land values, and farm debts shot upward. Farm real estate valued at 35 billion dollars in 1910 almost doubled in value by 1920. This inflation added 5 billion dollars to the farm mortgage debt in 10 years—a debt that often was more that the farms could carry. Farm real estate values reached their peak in 1919 to 1920 but farm mortgage debt did not reach its peak until 1923. The farmers entered the 1920's owing an estimated 12,300 million dollars, almost twice as much as they owed in 1914.

## Growth in Short-Term Loans

There was also a tremendous increase in short-term loans to farmers from 1917 to 1920. By 1920, short-term loans to farmers totaled 3,859 million dollars. Between 1914 and 1920, farmers increased their borrowings on this type of paper by 2,262 million dollars; much of this borrowing, incurred in the era of speculation and inflation, was refinanced later on a long-term basis. In the 1920's, short-term farm paper held by commercial banks decreased about 1,900 million dollars, while the total farm-mortgage debt increased by 1,200 million dollars.

This rise in farm land values and farm debt had no support in stable farm conditions. In one year, 1920–21, farm real estate values fell off 5 billion dollars. By 1924 farm land that had once been valued at 66 billion dollars had decreased, according to the Census estimates, by more than 15 billion dollars. The farm mortgage burden, which had more than trebled in a decade and a half, was then near its peak.

Difficulties connected with inflation in both farm prices and land values multiplied throughout the 1920's. The burden of interest

costs on high loans and of increasing farm taxes was crushing. During the period 1920–24 involuntary transfers of farm real estate almost trebled over the 1910–14 figures. In the next 5-year period, which was one of booming industrial prosperity, almost five times as many farms were involuntarily transferred as during the period 1910–14. The backwash of the World War inflation inundated the agricultural economy. Farm foreclosures and the drop in both farm prices and land values conspired to reach their respective high and low in the same year—1932. That is the record and those are the memories before us now.

## Loans on Normal Values

Throughout much of their lending history, the Federal Land Bank and the Federal Farm Mortgage Corporation have adhered to a policy of lending on the basis of normal values. Farms appraised by the FCA have been valued on the basis of their use in farming and not on the basis of a possible speculative rise in land values. Appraisals have been on neither inflated nor deflated market value. Lending on normal values during the period of low prices has proved a welcome device for stabilizing market values and for aiding distressed mortgagors. In a period of rising prices, this program of lending on a normal-value basis may tend to prevent price inflation, and to prevent a dangerous bull market in farms.

In order to encourage the prepayment of mortgage indebtedness, FCA borrowers are being offered a special inducement to set up a "future payment fund." Money placed by farmers in this fund can be applied to the more rapid retirement of their loans or held to meet payments at a later date. These funds will draw interest at the same rate at which borrowers pay interest on their loan. In most cases the rate amounts to 3½ percent. The Land Banks have always permitted the repayment of loans as rapidly as the borrowers desire to make repayments. This is a particularly desirable policy just now from the point of view both of the borrower and of the lender.

American agriculture today faces one of its biggest jobs in adjusting production to defense needs. Sufficient credit to meet the vital needs of agriculture in producing goods for use in our war effort must be made available.

Here is also an opportunity to aid agriculture to bring about a long needed shift from unprofitable and chronic surplus crops into more profitable production and sources of income. Harm will come, however, if we help farmers bid against one another for the same products and thereby unduly raise prices. Every effort should be made to avoid speculative increases in production by farmers not properly equipped. Yet sound loans in a proper relationship to prospective income-producing capacity can now be made. Such loans will encourage needed permanent adjustments in our agricultural production.

There is need for an educational program among local borrowers and farmers generally to warn them of dangers in the present situation. Included in such a program should be measures that will encourage farmers to build reserves against rainy days.

## Five Objectives in Credit Policy

Five primary objectives may be emphasized:

(1) To make normal values a primary factor in all appraisals for farm real estate loans; this is the soundest basis of appraisal in a situation like the one now before us.

(2) To impress upon present borrowers the wisdom of making use of higher incomes now available for the repayment of existing debts. This will be a factor in preventing inflation.

(3) To encourage farmers to build reserves out of higher incomes today to bridge the period when incomes may not be so high. This may be done by offering inducements to borrowers to accumulate funds to meet future payments.

(4) To avoid fostering speculative increases in production, while giving careful consideration to the needs for extending credit for making necessary shifts and increases in production.

(5) To encourage the sound use of credit to foster a better balanced agriculture that yields a higher and a more secure standard of living to the family farm.

By adhering to a program of lending on the basis of normal values, by discouraging speculative expansion in the farm plant and in production, and by encouraging the more rapid reduction of debt out of current incomes, lending institutions can help to protect agriculture against dangers that previously it has not escaped.

Two facts stand out in the 1941 farm credit picture. (1) There has been a substantial increase in repayments by mortgage borrowers; and (2) considerable expansion appears to be taking place in the use of short-term credit by farmer borrowers.

Farm foreclosures show a marked decline and collections are better. Payments of principal in advance of maturity to both the Federal land banks and the Farm Mortgage Corporation continue to increase; the upward trend in the amount of credit extended by these institutions for the purchase of farms continues; and their farm land sales are moving at a quicker pace.

Farmers used considerably more credit during the 1941 fiscal year than they did in 1940. Short-term credit extended through Farm Credit Administration was up more than 20 percent, and the change represented an increase for the fiscal year of more than 104 million dollars in this type of borrowing. Long-term credit extended through the FCA increased 27.6 percent. In dollar volume the extension of all types of credit through FCA in the 1941 fiscal year exceeded that of the previous fiscal year by more than 129 million dollars.

The trend in mortgage foreclosures continues downward. The Federal land banks and the Land Bank Commissioner for the second consecutive year report a substantial drop in forced sales. The number declined from 7,719 in the fiscal year 1940 to 4,969 in the fiscal year 1941. Remedial measures adopted in 1940, when more than 100,000 land bank and Commissioner loans were reamortized, together with improvement in general agricultural conditions, are responsible for this decrease. Reamortized loans are working out satisfactorily.

## MARKETING FACILITIES AND METHODS

This Department has always had a keen interest in the marketing spread between farmer and consumer. In recent years it has taken action to increase the efficiency of the marketing system. There is rather widespread misunderstanding, however, as to why market spreads are as wide as they are and what steps are necessary to reduce them. Consequently, surveys and analyses of market problems are of primary importance.

In 1940 consumers in this country spent about 14.8 billion dollars for food produced by the American farmer. Of this expenditure, about 8.6 billion went to pay various charges for transportation, processing, and distribution. There was left to the farmer a gross income of about 6.2 billion dollars.. This of course was exclusive of the return to him from cotton, tobacco, and exports. If consumer food expenditures were maintained or increased, while the marketing bill was decreased, farm income of course would be higher.

There are four ways by which marketing spreads might conceivably be reduced: (1) A reduction in the hourly wage rates of labor employed in the marketing system; (2) a reduction in profits and rates of return to capital invested in marketing enterprises; (3) an improvement in the efficiency of the marketing system which would cause it to use less labor and capital; and (4) a reduction in the amounts and kinds of service rendered.

Wages paid to labor are the largest single element in the marketing spread. In the first of the four ways to reduce marketing spreads, either the amount of labor required to process and distribute food products must be decreased by means of increased efficiency, or the wage rate per hour must be reduced. The objective of public policy ought to be to reduce marketing costs by increased labor efficiency rather than by wage cutting. Any reduction in wage rates would affect the farmer adversely to the extent that it curtailed consumer purchasing power. On the other hand, the farmer might gain directly from the reduction in marketing costs. Whether he would gain more than he would lose on balance as a result of wage cutting in the marketing system is difficult to determine. It is obvious, however, that a reduction of marketing costs by means of wage cutting alone would represent no net social gain. It would represent merely a transfer of advantage between different economic groups.

What about the second component of the spread between farmer and consumer, namely the profits or earnings of capital invested in marketing enterprises? Many believe exorbitant profits are largely responsible for the width of this spread and that the cure is simply to force food handlers to disgorge. The problem, however, is not so simple. Profits and earnings on invested capital do not represent a large proportion of the marketing spread. Out of $1 of sales made by the typical grocery chain, about 2 cents remain for profits and earnings to capital. The profit margin for the dairy corporations is 4 or 5 cents per dollar of sales; for the meat packers it is about 2 cents. These figures are not to be confused with the rate of return on the capital invested. They show merely the importance of profits as a component of marketing spreads.

The total marketing spread would obviously not be reduced greatly even by the elimination of earnings to capital invested in food enterprises. For most food products probably not over 5—at most 10—percent of the retail selling price is represented by the combined earnings to capital at all stages in the marketing process. This does not mean that even relatively small savings are unimportant. Certainly we should not condone an exorbitant rate of profit derived from monopolistic or unfair trade practices. But other factors, such as wage rates, material costs, and the over-all efficiency of the marketing system, are considerably more important than profits in the determination of marketing spreads.

### Savings Through Reorganization of Marketing

How much marketing costs can be reduced through increased efficiency in marketing depends largely on how far we are willing to go in reorganizing the marketing system. Many gains have been made within the present framework. More such gains can be made. Improvements in the efficiency of individual firms and of cooperative marketing associations, reorganization of terminal wholesale facilities, changes in types of retail stores—all these expedients make for some reduction in marketing costs without drastic reorganization of the system. Expected savings by these means, however, are often exaggerated. There is disappointment when they do not come true.

Most efforts by the farmers themselves to reduce marketing costs have been made by means of cooperative-marketing organizations. These ventures have been confined for the most part to processing and marketing operations at the producer end. Examples are the local cooperative creameries, grain elevators, cotton gins, livestock-shipping associations, and fruit-packing plants. The farmers' cooperative movement has led to great improvement in the marketing sphere within which it has mainly operated. It has resulted in larger and more efficient local plant facilities, a better competitive situation, improved quality and various other gains calculated to improve returns to member farmers. But the costs of local marketing functions represent only a small part of the total marketing spread. The greatest possible gains to be made there do not bulk large in relation to the retail price of farm commodities.

Greater gains are possible in food processing and in the terminal and wholesale markets. Even in this field, however, it is easy to overstate what might be done without a complete reorganization of the marketing system. There is serious inefficiency and disorganization in the terminal wholesale facilities for fresh fruits and vegetables. These facilities in most of our large cities are antiquated, ill-adapted to the handling of motortruck receipts, and altogether inadequate for the efficient wholesaling of perishable produce. Waste and spoilage are excessive. Intracity cartage costs are high. Margins taken by wholesalers and jobbers are wider than they might be if good market facilities existed. Studies made by the Bureau of Agricultural Economics indicate that savings approximating 2 or 3 percent of the retail price of perishables are possible within the terminal wholesale market.

## The Retail Segment

Most important of all marketing functions from the standpoint of the charges involved is retailing. The retail margin commonly amounts to from 20 to 35 percent of the retail price to the consumer; it varies with the commodity involved. This does not mean that the retailer is less efficient than handlers at other stages in the marketing system. Nor does it mean that his profits are exorbitant. It means simply that here is one of the most likely places to effect important savings in food distribution.

The outstanding recent development has been the growth of integrated mass-retail distribution. Corporate grocery chains and voluntary and cooperative chains exemplify it. Mass distribution causes food products to move more directly from farmer to consumer. How much it has reduced marketing spreads we do not know. Studies made by the Federal Trade Commission and other public agencies indicate that mass distributors can and do sell to the consumer at prices somewhat below the prices of their competitors. Yet there are many exceptions.

Another important development is the introduction of new low-cost methods of food retailing, notably the supermarket. Essential features of the supermarket are tremendous store volume (often 10 or 20 times that of the average grocery store), low store overhead, and a reduction in store labor through customer self-service. Within the last few years, stores of this type have become an important factor in the grocery trade. Older grocery chains have converted many of their retail units into supermarkets.

Essentially the same idea is back of the milk depots recently set up in several large cities. These depots sell milk at greatly reduced prices to persons who forego doorstep delivery. Marketing developments of this kind have a special appeal to low-income groups and to persons who prefer lower prices to extra marketing services. They should be allowed to develop in accordance with the wishes of the users.

## Duplication of Facilities

Savings that can be made within the framework of the present marketing system, however, leave untouched one of the main causes of high marketing costs. They do not lessen the duplication of processing, transportation, and marketing facilities which arises out of competition. We have made progress in improving the efficiency and reducing the costs of individual firms; but this progress has not resulted in a proportionate improvement in the over-all efficiency of marketing. It has not limited the number of firms or the quantity of labor and capital used in food distribution.

How much the needless duplication of marketing-facilities costs at all stages of food distribution and how much it adds to marketing spreads has never been even approximately determined. But the number of retailing, wholesaling, processing, and assembling establishments has multiplied out of all proportion to what would be needed if food distribution were organized on what might be called a social-engineering basis. The number of grocery stores, for example, has

increased from about 160,000 in 1900 to 387,000 in 1939. Nor is this situation confined to food retailing. It exists to some extent at every point in the marketing system. We do not need all our creameries and canneries and grain elevators to handle our present food supply. Studies have shown repeatedly that many of these plants operate at far less than their capacity. Substantial savings could be made if all of the supply were to move through efficient plants operated at full capacity. This would mean a substantial increase in the average size of plant and of handling agencies. It would certainly mean a reduction in the number of handlers and would bring the over-all capacity more in line with the facilities actually needed to process and distribute food products.

Clearly it is not easy to effect any substantial reduction in marketing spreads. It does not help much to pay lip service to the idea of achieving greater economies in our marketing system if we do not understand just what is wrong with it. It should be recognized, too, that even the diagnosis of the trouble is not yet satisfactory in all respects.

### The Department's Programs

Through its various programs, this Department is helping to reduce marketing charges. Its Market News Services help to provide the basis for flexible prices. Its services to cooperatives promote improvement in market organization, particularly at the producer end. Through regulatory-law administration on the price-making exchanges and in the terminal centers it exercises an influence toward more reasonable charges and fairer market practices. It has made studies and recommendations directed toward improving the wholesale facilities for fruits and vegetables in large city markets and is beginning similar work with respect to other parts of the marketing system. The various surplus-disposal programs—the food-stamp plan, the direct distribution of surpluses, the school-lunch program, and the low-cost-milk system measure are important aids to better marketing. Such intervention in the marketing process enables the Department to cooperate with the food trade in various ways of reducing the costs and increasing the usefulness of the marketing system.

## AIDS TO FARM SECURITY

The Farm Security Administration has directed its entire program toward support of the National Defense Program, has undertaken special defense assignments, and is enlisting the fullest possible participation of its borrowers in the food-production program for 1942. Defense-employment opportunities and changes in the agricultural economy have called for a review of problems facing low-income farm families. In addition, homestead projects have progressed to a point where preliminary evaluations can be made.

### Increasing Food Production

The production of food for home use, a basic part of the rural-rehabilitation program, is being expanded to enable borrowers to

contribute to food-production goals for 1942, particularly those for livestock, poultry, and dairy products. First effects probably will be felt in South Carolina, Georgia, Florida, and Alabama, where more than 80,000 FSA borrowers, aided by supplemental loans averaging $80 each, are increasing poultry flocks by 50 chickens and acquiring 1 more brood sow or 2 more milk cows. Some families are substituting a second 50 chickens in place of the cows or sow.

Cooperative activities have enabled small farmers to take an ever-growing part in defense production. Individually unable to provide themselves with services and equipment needed, some 371,000 farm families have banded together in more than 20,100 co-op groups to purchase tractors, combines, and other machinery, to obtain work-stock insurance, purebred sires, home services, and marketing facilities.

Five years of rural rehabilitation, aimed at conservation of human, soil, and water resources, and with maximum responsibility on the part of the borrower, have produced results in the form of better health, higher morale, and greater productive capacity among the low-income farm families. A survey made at the close of the 1940 crop year showed FSA borrowers have increased their net incomes an average of 35 percent, or from $480 during the year before borrowing from FSA to $650 in 1940. Their average net worth—total assets minus all obligations—increased from $781 to $1,051, in the same period. For the Nation, this meant a total gain in net income of $75,289,838 and an increase of $79,702,251 in net worth.

The average value of goods produced for home consumption increased from $163 for the year before they entered the program to $264 in the 1940 crop year. FSA borrowers in 1940 produced an average of 391 gallons of milk per family, 391 pounds of meat, and 266 quarts of fruits and vegetables which were canned for winter use.

### Experience Gained in Homestead Development

The families on FSA homestead developments have shown improvement in farm and home management, have acquired new skills, and have increased their capacity to produce foods for defense. Progress has been made in giving these families greater responsibilities in the operation and management of the projects. In addition, young people on 40 projects are receiving special training for defense employment.

Teachers provided by State offices of education are now giving courses in welding, radio transmission, hot- and cold-metal work, and electricity. Various refresher courses in mechanics are being given, and boys from both projects and neighboring areas are attending the schools. The training program is designed to prepare the boys for industrial employment later, as well as for special demands of the National Defense Program.

There are 151 FSA homestead developments, most of which were started by the Federal Government to help some 13,000 distressed farm families get a new foothold on the land and to develop patterns of tenure and land use in certain problem areas. Ninety-two of these projects are in community form, with farm homes centered around community facilities such as schools, stores, cotton gins, and other services. The other farm projects consist of scattered farmsteads in

rural areas having adequate community facilities. In 3 years of operation of these projects much has been learned about their planning, development, and management. A variable payment-purchase plan has been worked out to enable families to make minimum payments in years of low returns, and larger payments in good crop years. The purchase price of the farms is based on productive value of the land under sound farming methods.

Earlier difficulties in obtaining community-manager personnel are being overcome. Minimum qualifications include farming experience, administrative experience, and an understanding of problems of homestead families. FSA has trained a staff to meet these requirements, and several of the agricultural colleges are giving special training to qualify men and women for this type of work.

Eighteen of the homestead projects, containing 1,151 units, have been transferred by the Government to private ownership. Associations formed by the homesteaders, in most cases, have purchased the entire development, and then made individual tenure contracts with the families. These associations handle community real estate and pay taxes in a lump sum. This is a convenience both to local authorities and to the families. The families make tax payments in monthly installments with purchase payments. Savings in maintenance, insurance, and other costs are also effected through the associations.

In building homesteads, the Farm Security Administration and its predecessor agencies have developed low-cost, practical farmhouses. Precutting and prefabricating and using power tools and shopyard assembly have meant savings in transportation, labor, and materials. By this method, a one-story frame house of 830 square feet of floor space—including three bedrooms, living room-dining room, front porch and screened work porch—can be built in the South for an average direct construction cost of $1,217.

Cooperative community services, such as gins, stores, and large-scale machinery, have proved simple and effective. They have been established on about 60 percent of the projects. Experience with complete cooperative farms developed on a few of the projects has brought out several factors. The farms must be large enough to afford skilled management. Work should be divided so that each farmer does the job he knows best. The farm should not have too many small enterprises, and it should not carry out a program requiring large amounts of outside labor for short periods. Opportunities must be provided for graduating farm laborers to greater responsibilities.

In the best cooperative farms, the fixed investment required is only about three-fifths of that required on small individual economic units. Experience gained in developing the homestead projects serves as a guide in several current programs.

Land-leasing associations, formed by sharecropper families, have leased large plantations to sublet to their own members. Through the associations, the families obtain marketing and purchasing services, the use of cotton gins and large-scale machinery, farm and home management advice, and other services ordinarily not available to them. At the close of the 1940–41 fiscal year, 41 land-leasing associations had been formed with some 1,600 member families. Others are being developed.

The Farm Security Administration makes loans to farm families for settling and developing new lands brought into production under the Wheeler-Case Act. The act provides for supplementing existing irrigation facilities and for new irrigation projects in 17 Western States, to give opportunities for families displaced by drought and duststorms, or with inadequate dry-land farms. All of the construction of irrigation works is done by the Bureau of Reclamation. The settlement of these areas is to be administered by the Farm Security Administration. So far, 12 such water-conservation projects have been approved.

## Security for Farm Tenants

Security for farm tenants, through attainment of ownership under the Bankhead-Jones tenant purchase program, assumes special importance in the light of the national emergency and world conditions. It gives formerly insecure tenants and sharecroppers a firm foothold on the land, gives them new independence and a new interest in the Nation's welfare. During the past year, the Farm Security Administration made 8,668 tenant-purchase loans, the largest annual total yet reached.

In the 4 years of the Bankhead-Jones program, 20,721 families have bought farms. These loans average $5,648, and throughout the country delinquencies amount to only 3.5 percent. Extra payments by borrowers who have had good crops amount to $125,564.

The Government has excellent security in these loans. All farms bought with Bankhead-Jones loans are operated under farm and home plans that provide for home production of family food needs, diversification of crops, and conservation of the soil. The Government's legal security is a first mortgage on the real estate, which has been appraised by a county committee of three farmers. The Bankhead-Jones loans are repayable over 40 years with interest at 3 percent. In many cases, the annual installment, plus taxes and insurance, is less than was formerly paid in rent for the same farm. A survey of 3,962 borrowers showed rents formerly paid by the families averaged $349, while their average annual payments on tenant-purchase farms was $317, including taxes and insurance.

Improved rural housing is a major effect of the tenant-purchase program. In the first 4 years of the program, 9,915 houses were built, at an average cost of $1,383 each, and 10,279 existing houses were repaired at an average cost of $429 each. House construction or repair was necessary on 97.5 percent of the farms bought.

The average tenant-purchase borrower had a net worth of $1,686, before receiving his Bankhead-Jones loan. After about a year and a half on his own farm, his net worth had increased to $2,006.

## Camps for Migrant Workers

Camps for migrant agricultural workers will be available in 14 States when all shelters now being planned are built. Additions have been made to existing camps in Florida, Texas, Oregon, Washington, and Idaho, and new camps are already open in Arkansas and Colorado.

Shelter for 15,000 migrant families will be available at one time in all of these camps, or for 60,000 families in the course of the year.

This is an increase of 50 percent in facilities available June 30, 1940. The typical camp consists of from 200 to 300 wooden shelters and tent platforms, grouped about meeting centers and recreation grounds, laundry and toilet facilities, and clinic and isolation wards.

Two additional types of camps have been developed. One has small inexpensive cottages with garden plots for families having year-round employment. The second development is the mobile camp, with trailers and tents, for use in areas where farm laborers are needed for short periods. Laundry and toilet facilities, meeting places, and medical services are provided at all camps.

### Medical Care for Farm Families

Through cooperation with the medical profession and the Farm Security Administration, more than 100,000 farm families in 35 States are receiving necessary medical care under a plan which preserves fundamentals of American medical practice: The cost is based on ability of the families to pay, and the families have free choice of their physician.

Started 5 years ago in a few rural counties, this medical-care program has now spread over 900 counties. The number of participating families has increased 25 percent since June 30, 1940.

No medical-care plan is begun without approval, first of the State medical association, and then of the medical society in the county where the plan is to operate. The cooperation of the local group is necessary to the success of the medical-care program. Under a typical plan the families pool their funds with a trustee, making payments of from $15 to $35 per family per year—the payments being based on the services covered, the size of the family, and the average annual income of the families in the area. The trustee is selected by the families, through their medical-care association. The trustee cannot be an employee of the Farm Security Administration, but must be approved by both doctors and the Farm Security Administration.

The physicians submit their bills for services rendered to the trustee. Before payment is made, the bills must be approved by a committee of doctors named by the county medical society. The funds in the pool are divided for distribution monthly. Bills are paid in full when possible, and on a pro rata basis when money is not available for payment in full.

### Special Defense Assignments

An estimated 15,000 farm families will be displaced from farms as a result of the acquistion of more than 4 million acres of farm land for defense purposes. At least 6,400 families have already been displaced. Many of those who have removed from defense areas have displaced families on farms far removed from the defense project itself, often in another State.

Owners of farm land in the defense areas have found it difficult to obtain new farms, especially in the already crowded areas of the South and Middle West. Owners with small equity, tenants, sharecroppers, and farm laborers have been particularly hard hit. The Department has been able to help these people through the Farm

Security Administration, since many families were in need of the type of assistance given by FSA in its rural rehabilitation and resettlement program.

The first step in this relocation work is to survey the area to determine the number of families needing help, the type of help they will need, and how much. Other agencies of the Department and the State Extension Services have cooperated in this work and in subsequent steps. Agricultural Adjustment Administration field personnel have helped particularly in making lists of farm land available. In 17 States, State defense-relocation corporations were organized and borrowed funds from the Farm Security Administration for the purchase and development of farms for the displaced families.

In addition to its defense-relocation work, the Farm Security Administration has been designated as construction agent for the Federal Works Administration in the building of permanent homes for defense workers in five localities: 200 units at Radford, Va.; 150 at Pulaski, Va.; 1,000 at Greenbelt, Md.; 60 at Weldon Spring, Mo., and 72 at Taft, Calif.

At Radford, 129 units were built in the city and the remainder on farms within commuting distance of the defense plant. The rural houses were built on farms whose present housing is substandard; when the need for emergency housing has passed, the houses will be sold to the farm owners. This plan was worked out jointly by the County Planning Committees of Montgomery, Giles, Pulaski, and Floyd Counties of Virginia, the Bureau of Agricultural Economics, the Extension Service, the Farm Security Administration, and other Federal and local agricultural agencies.

The Pulaski houses, all within the city limits, are duplex units.

The 1,000 new Greenbelt houses are located around the present development, following patterns of modern planning with parks, lawns, and minimum thoroughfares in residential areas.

The new homes at Weldon Spring will have subsistence-garden tracts adjoining.

At Taft, the defense homes will be apartment buildings, of six units each, following patterns of apartment labor homes in California.

Utilizing experience gained in the migratory-labor-camp program, the Farm Security Administration is building temporary shelter for defense workers, on assignment from the Defense Housing Coordinator. Trailers, dormitories, and portable houses at 20 sites will house nearly 6,000 single workers and more than 3,500 families. These shelters can be moved to any emergency housing area.

### Defense Employment for Farmers

Defense-employment opportunities have opened for comparatively few low-income farmers largely because distribution of defense work has been least in areas of greatest poverty. Only 10 percent of the defense contracts have been placed in the South, where 44 percent of FSA borrowers live. About 45 percent of defense contracts have been placed in the Northeast, where less than 3 percent of FSA borrowers live.

Even borrowers who live near defense projects have difficulty in getting defense jobs. Their experience has not prepared them for

industrial employment, few of them have the skills required, and usually they are older than the average industrial workers. (More than half of all FSA borrowers are over 45.)

Should defense industries draw too heavily on farm labor, the results may be serious for many farm families. Quitting the land for temporary defense employment may leave them with no place to go when defense employment ends. As an alternative to farm abandonment, the FSA encourages farm families to change their operations to allow one or more workers to take defense employment, but to retain their ties to the land. The FSA is aiding farmers near defense projects to supply increased demands for truck crops, dairy, poultry, and livestock products, through cooperative storage and marketing facilities. Most of these opportunities may contribute permanently to security on the farm.

For many years, less than half of America's farmers have been producing more than 90 percent of the marketed agricultural products. The 1940 census showed continuing increase in the number of commercial size farms, as opposed to the family-type farm, a trend which may be speeded up by defense demands. Farm Security Administration, through its program for helping small farmers obtain better tenure, credit, education, equipment and marketing facilities, is enabling them to contribute to the defense effort, and to hold their places on the land. It is worth noting, as a sign of the need, that as many more families need FSA help as now are receiving it.

## FINDINGS OF THE AGRICULTURAL EXPERIMENT STATIONS

Farm conditions are changing so rapidly that farm research must change too. The agricultural experiment stations in the several States and in Alaska, Hawaii, and Puerto Rico are alive to this fact. They are scrutinizing carefully their old and their new research projects so as to give them maximum defense effectiveness. The emergency has necessitated some redirection of the work both as regards production needs and adjustment to changed economic conditions. It appears on the whole, nevertheless, that the activities of the experiment stations, with some change of emphasis, fit in well with defense requirements. The Department's Office of Experiment Stations helps to coordinate the projects, under legislation which requires it to pass on proposed expenditures with Federal funds.

Recent work has been exceptionally productive. Scores and indeed hundreds of examples could be cited. There is space in this report for only a few. They show especially the wartime problem which differs from that of the years that immediately preceded World War I. The wartime problem puts production rather than surplus limitation in the foreground—the production especially of agricultural goods that are essential in our defense program. There is need for research to facilitate production against the handicap of scarcities in farm labor and farm machinery, and to expedite necessary wartime shifts. Present conditions set problems that demand all sorts of farm adjustments, some of them in production methods, some of them in production goals. It is a task not merely in farm practice but also in farm science. What the State experiment stations are doing to speed it is a story of which the following items are merely hints.

Some of the research looks toward economies in nonfarm as well as in farm work. Thus the Connecticut (Storrs) Station has made a study of milk marketing that shows how labor and gasoline may be conserved. In 1937 the Hartford area obtained 200,000 pounds of milk daily from wholesale producers. It had some 190 truck routes in operation. Milk trucks on these routes traveled more than 3,000 miles every day. Producers had to pay an average charge for the service of 25.4 cents per hundredweight of milk.

Efficient revision of the system, the Connecticut (Storrs) Station reported, would effect a big saving. It would permit an adequate handling of the daily milk supply by only 29 trucks, which would have to cover only 1,540 miles a day. They could handle the milk supply at a cost of 15.1 cents per hundredweight. The study showed that with other costs unchanged the delivery costs increase 6.9 cents per day per hundredweight with each additional mile traveled. Appropriate changes in the supply areas and the transportation system would benefit both producers and distributors.

One urgent need is more farm storage of grain. In many areas this requires a reduction of the moisture content to prevent loss from heating and mold. A portable grain drier has been developed by the Maryland Station and used effectively for drying grain harvested in bad weather. General use of this drier should reduce the loss from grain spoilage, facilitate the Ever-Normal Granary, and be specially valuable when lack of shipping facilities makes farm storage indispensable.

The manufacture of industrial alcohol from starch- and sugar-containing raw materials supplies a market for farm crops and byproducts. It may become more important in the event of a gasoline shortage. Studies at the Idaho station look toward improvement in the conversion process. One large cost item heretofore has been distiller's dried malt, required to convert starch to fermentable sugars. The Idaho program has developed two low-cost diastatic agents which make the use of high-cost malt unnecessary. To use the new saccharifying agents an improved process has been developed in which recoveries are 95–100 percent instead of the previous 75–80 percent. These developments should reduce the cost of producing alcohol from starch-containing raw materials.

## New Uses for South's Crops

Research by the Mississippi Station is promoting the use of cotton as a roofing material. It may help to relieve shortages of other materials. Teamwork between scientists of the station and a neighboring cotton farmer, who conceived the idea of making shingles of a mixture of cement and cotton and demonstrated the possibility, has solved some of the manufacturing and utilization problems. About 10 pounds of cotton are used per square of shingles. At this rate there is a potential use for 2 million bales of cotton annually as a roofing material. In 1930 some 100 million squares of roofing materials were sold in the United States. It is practicable for farmers to make and lay their own roofing of cement-cotton shingles. The lower cash outlay involved would result in appreciable savings. The

Mississippi station is doing research on the use of other cellulose materials as well as cotton for roofing, and also for siding and wallboard.

Nearly one-half the sweetpotato crop, the most important vegetable of the South, is lost each year through decay and shrinkage. Customary methods of heating result in wide fluctuations of temperature and humidity, which are probably partly responsible. Growers have recently become interested in the possibility of heating storage houses with electricity. Experiments by the South Carolina Station have indicated that this is an economical source of heat for both curing and storing. It maintains a relatively uniform temperature and humidity. This station is also studying the possibilities of dehydrating cull sweetpotatoes and using the resulting flour.

Heretofore, the 500 or more oil-processing plants in the Southern States have been devoted largely to cottonseed crushing. In recent years increased quantities of other crops have become available for crushing, such as peanuts, soybeans, and flaxseed. There is need for research on desirable changes in plant and processing methods. Study of this problem by the Tennessee Station is yielding valuable results. They include (1) a cooking procedure adapted to solvent operations for cottonseed, linseed, and soybeans, (2) a new cooking method for cottonseed meal which yields oils with very low refining losses, (3) the design of a practical and simple continuous oil extractor, and (4) the adaptation of instrument controls for the pressure cooker.

The Tennessee station is also investigating the manufacture of derived products such as plastics, adhesives, and foods and feeds. Recent experimentation has derived a sample low-cost plastic material from cottonseed-hull bran. Production of it has been developed in a commercial molding plant which manufactures sheaves for textile looms. Several hundred thousand of these sheaves, made of the new plastic, already are in use and have demonstrated their fitness. Various other plastics have not proved suitable for the purpose. The utilization of cottonseed-hull plastics for special purposes, particularly where strength and hardness are required, promises to increase the value of a cheap cotton byproduct.

## Results of Special Defense Value

Located in a center of military, naval, and defense industry activities, the New Jersey station has been confronted with demands in mosquito control. Its department of entomology is serving as a liaison agency between the military and other authorities with mosquito-control problems to solve. WPA projects have been arranged at a number of strategic points. This work may advance mosquito control in New Jersey considerably beyond what would have been achieved under normal conditions.

The Missouri station has demonstrated that the milk and fat production of cows and goats may be increased by the use of thyroid substance or thyroxine. This material, however, is costly. Recent research at the station has chemically combined the proteins of skim milk with iodine in such a way as to produce an artificial thyroprotein at low cost. This product has all the properties of thyroid substance; moreover, it has a potency much higher than that of any thyroproteins produced heretofore. Feeding 5 to 10 grams daily

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to goats increased their milk production. Feeding 50 to 100 grams daily to cows that were falling off in milk production stimulated them to produce more milk. This cheap source of thyroprotein should be useful to the dairy industry. It may be useful also to stimulate the growth of fat-producing types of animals that have a naturally low thyroid activity.

Carrying capacity of the average pasture in Massachusetts appears to be only about one-fourth cow per acre, a relatively low figure for a region of its latitude and rainfall. The Massachusetts station has investigated pasture plants new to the State and has improved strains of old species. It has defined more closely some of the weaknesses of the common strains and sought ways to overcome their shortcomings. Strains and selections of timothy, orchard grass, meadow fescue, perennial ryegrass, and red clover have been found which are proving well adapted to the soil and climatic conditions of the State and of superior performance. These studies are of defense significance, because of their relation to the cost of milk production and because they may lessen the burden on transportation of bringing feedstuffs into the State.

Protein constitutes one of the most expensive portions of the dairy ration. Cheapening of this element would be very desirable. At least four stations—Hawaii, Illinois, New York (Cornell), and Wisconsin—have been experimenting with urea as a relatively low-cost protein for dairy cattle and sheep. Although the results have showed some variations, it appears that the replacement of one-half of the nitrogen of linseed meal by urea nitrogen offers promise when protein-rich feeds are high in price.

Nitrogenous material in the form of protein may soon occupy a position of industrial importance. One indication is the development of a synthetic fiber from milk casein. Plants offer a cheap source of protein material. They might satisfy many demands for it in industrial uses, and much plant material could be diverted to that end. The Mississippi station is studying oil-bearing seeds with this in view; it has found that a protein with a purity of 99 percent can be recovered from cottonseed. This is well above the requirement for industrial utilization. It may be possible to spin fibers from this protein which will equal those obtainable from soybeans and peanuts. The unpurified protein has been made into furniture and plywood adhesive equal to the best grades; it has shown promise for use in paper sizing. For plastics, a mixture of cottonseed protein and formaldehyde-phenol resin has given a product of very low water-absorbing power; a formic acid-glycerine solution has given a cork-stopper bottle seal, equal to the best synthetic resin seals. Furthermore, the residual cottonseed cake, after removal of a portion of the protein, has been processed into oil and cottonseed cake or meal for livestock.

### Studies of Vitamins

Studies of vitamins and their supply at reasonable cost and convenience are important in nutrition. Two series of experiments have dealt with the synthesis of some of these materials by dairy cattle. The Alabama Station has found that the lower vitamin A content of

milk in the winter can be rectified in that State by the use of green forage crops. Permanent pastures and dairy feeds are generally low in vitamin A. Experimental feeding of green forage crops, such as Italian and abruzzi rye and crimson and white Dutch clover, more than trebles the vitamin A content of the winter milk.

The Ohio Station has shown that feeding large amounts of vitamin D to cows will markedly increase the vitamin D content of their milk, although the efficiency of the transfer is low. The vitamin D in irradiated yeast is somewhat more efficient than that of irradiated ergosterol for the production of vitamin D milk. Milks rendered rich in vitamin D either by irradiation or by feeding cows irradiated yeast proved equally efficient in providing the vitamin D requirement of rachitic children.

Research at the Washington Station has indicated the possibilities of supplying vitamin D for use in poultry and animal rations by fish oils produced on the Pacific Coast. This practice could replace the need for imported supplies. The Pacific oils were found to contain large quantities of vitamin D. In some cases much larger amounts were present than the standard requirement for imported cod-liver oil for human use.

These illustrations, typical of work at the experiment stations, tell only a bit of the story.

## FOREST ACTIVITIES UNDER THE IMPACT OF WAR

The National Defense Program speeds up the use of our forest resources, and makes use of forest-land services for the protection of water supplies for cantonments, training areas, industrial centers, and agricultural lands. Such places are often subject to floods, stream silting, and soil erosion, which forest management may limit or prevent.

Some idea of the defense drain on our timber supply can be gained from the fact that our new Army may require some 3 billion feet of lumber for use within the United States. Our production of lumber in 1939 was 25 billion feet; in 1940 it was 27 billion feet; in 1941 the requirement may reach 32 billion feet. There is an important defense use for spruce and Douglas fir for airplane construction, for hickory in making skis, for oak in shipbuilding. The greater part of the increase in the demand is attributable, directly or indirectly, to the defense program. It makes calls on both public and private forest land.

Another heavy call on our forest resources comes from the current increase in paper consumption. This involves a heavy new demand for domestic wood pulp, in part because the war has reduced our imports of wood pulp from Europe. In 1938 our paper consumption was 13 million tons. It increased to 16½ million tons in 1939 and the estimate for 1940 is 18 million tons. Consumption of pulpwood was 9 million cords in 1938, 11 million cords in 1939, and about 14 million cords in 1940. Under the defense emergency the demand for pulpwood increases also to supply many defense requirements such as explosives, plastics, lacquers, and rayon.

These demands widen the disparity between the drain on our forest resources and effective forest growth. They stimulate the destructive liquidation of our forests and deplete the growing stock. The final

result, if we do not take steps to guard against it, may be a new crop of ruined forest areas and communities.

It should be frankly recognized that defense production, as we have conducted it up to the present, will further cripple our forest resources and plant seeds of rural problems. This is not only unfortunate; it is unnecessary. Relatively simple methods of forest cutting and other practices if applied on a Nation-wide scale could give us what we need from the forests for defense programs and at the same time build up the forest resources. Studies made in the Forest Service indicate that an increased output of forest products can be obtained without excessively depleting our forest resources. It is possible, in other words, to get adequate supplies of forest products both for defense and for civilian use by methods which at the same time will strengthen our forest resources for the long pull.

As evidence of forest contributions to the national defense through agriculture, we can take some of the things done by the Forest Service in 1940. It helped the Extension Service and the States to produce 195 million young forest trees and distribute them to farmers at cost. It planted nearly 2,700 miles of shelterbelts which, with previous shelterbelt planting, brought the total of such plantings up to 17,000 miles. These shelterbelt plantings helped to protect soil and cultivated crops on more than 26,000 farms in the prairie States. It cooperated with the Extension Service and with various State agencies in assisting 43,000 farmers to make woodland-improvement thinnings. It aided 48,700 farmers in making selected cuttings in their farm woodlands, and 20,000 farmers in marketing their forest and woodland products.

In various States the Forest Service cooperated with State agencies in showing farmers the dollars-and-cents values of good forest practices. It gave advice to thousands of farmers in the construction of firebreaks. This work is among the forestry practices whereby farm owners may qualify for conservation payments. In addition, the Forest Service cooperated with the Farm Security Administration in helping the latter's tenant purchasers and rehabilitation clients to get revenue from their farm woodlands and at the same time to maintain this resource undiminished.

On land in farm and other private ownership, and on State-owned land, the Forest Service helped to extend cooperative forest-fire protection. Such protection in 1940 covered more than 281 million acres in 41 States and in Hawaii. In these protected lands the area burned over was only 2.9 million acres; the damage was only about 6.2 million dollars. This was small compared with the loss that occurred on unprotected forest land. At the same time, the Forest Service encouraged better timber management. It cooperated especially with naval stores operators in the southern pine belt.

### Forest Research for Defense Needs

Much of the Forest Service research has been adapted to defense needs. The work of the Forest Products Laboratory is an example. This is the only Federal agency devoted exclusively to technical and scientific work on wood and other forest products. It has given special attention to the use of wood as a substitute for such key materials

as aluminum. Its defense studies include work on airplane wings, fuselages, and propellers; on the construction of ships and of boats for the mosquito fleet; on shipping containers that will save cargo space; on chemical products essential for war and defense uses generally, including alpha cellulose for explosives, plastics, rayon, and the like; on gas-mask charcoal; on plugs for naval shells; on antiknock compounds for gasoline; and on housing and airplane-hangar and other construction problems.

"Compregnated wood" illustrates the ramifications of research in the uses of wood and other forest products for national defense. This new product, in which the War and Navy Departments have taken great interest, is wood impregnated with resin-forming chemicals and subjected to pressure so that it becomes practically waterproof and will not warp, swell, or shrink. It can be compressed to one-third of its original size with corresponding increase in its mechanical properties, or it can be made in its normally uncompressed dimensions. It can be molded to have a surface nearly as smooth and hard as glass or it can be produced with a natural surface. It can be pressed so that its density will vary from one point to another as may be desired.

Some other recent contributions of the Forest Products Laboratory to the defense program are worth a mention. Recent kiln-drying experiments reduce the seasoning period of 3-inch by 14-inch aircraft spruce from 35 days by standard schedules to 15 days. Urea chemical seasoning accomplishes this shortening of the seasoning period with no weakening of the wood. The laboratory has redesigned a shipping container for bombs so that it uses less wood, weighs less, costs less, requires less cargo space, and has greater strength than the original container. In making newsprint paper the laboratory has developed a high-yield semichemical pulping process which permits the use of "weed" hardwood species in substitution of the more valuable species. In the development stage at present, is a simple soaking treatment followed by a drying process which permits easy molding or bending of wood for boat ribs and other purposes.

## Forest Conservation Plan

Most forests renew themselves readily under rather simple methods of cropping. They produce continuous supplies of raw materials and are permanent sources of rural and other employment. Most of the best and the most accessible of our forests, however, are in private ownership and are still mined rather than cropped. Instead of being built up, most of them are still being deteriorated. This is not necessary even during the defense emergency. It is unwise land policy and unwise national policy. Measures are necessary to stop the deterioration of privately owned forest land and to make it more productive. Nation-wide public regulation of cutting and certain other practices on privately owned forest land appears to be desirable. The Department has recommended such a measure in a report to the Joint Congressional Committee on Forestry.

This proposal does not contemplate regulation of forest product prices; nor would it determine when the private owner may or may not cut his timber. Nor, except with his voluntary consent through cooperative sustained yield legislation proposed by industry, would it es-

tablish the rate of cutting above which the private owner may not go. But the Department's proposal does aim at Nation-wide public regulation of how privately owned forests may be cut, if the cutting takes place.

Some forest-industry leaders agree that there is need for national regulation of this kind. Most of them prefer State regulation. This Department believes in straight Federal administration. It has recommended a trial, however, of what it considers a compromise plan that includes the minimum of Federal participation that will insure success. The plan provides that the States shall have a reasonable time to pass forest regulatory legislation of their own and get the administration of it underway.

The plan also provides:

(1) That State legislation and standards of enforcement shall be satisfactory to the Federal Government;

(2) That if requested by a State to do so, or if after the formative period a State does not undertake it or does not attain satisfactory standards, the Federal Government is authorized to take over the job;

(3) That if State enforcement proves unsatisfactory, Federal assistance in regulation shall be withdrawn and the Federal Government may withdraw assistance in other cooperative forest projects.

Certain fundamental principles underlie the plan recommended by the Department. One of them is that requirements to start with shall be simple and yet adequate to stop further destruction and deterioration of the forests and to keep them reasonably productive.

Another is that the requirements shall vary with local conditions and be susceptible of development as rapidly as forest-landowner opinion, public opinion, and other conditions permit.

Another fundamental principle is that the free play of democratic processes shall be assured, and that safeguards shall be maintained against objectionable bureaucracy along with safeguards against seizure of the regulatory machinery by the regulated interests.

Two other basic principles are that the regulation shall be Nation-wide, with minor exemptions where it is not necessary; and that the administration of it shall be decentralized as much as possible.

The public interest in privately owned forest land creates a public obligation with regard to it, which can be redeemed only through the cooperation of public agencies with private forest-land owners.

This cooperation should provide more information to farm and industrial owners of forest land and more help to them in solving their problems. It should help to retain existing uses and markets for forest products and to develop new ones. It should help to protect private forest lands from fire, insects, and diseases, and should furnish forest trees and forest tree seeds to help make idle land productive again.

It should include aid in establishing cooperative associations to help farmers and other small owners of forest land, and aid in setting up cooperative sustained yield units within which private and public forest-land resources may be pooled under a system of management that will assure more security and stability to established industries and communities.

There is need for the cooperation of various public agencies in removing tax obstacles in order to encourage better forest practices, and in establishing better forest practices that will help stabilize county and State incomes from current taxes.

There are many other matters in which the cooperation of public agencies with both large and small forest operators can be helpful. They include methods of harvesting and marketing forest crops more profitably; methods of utilizing inferior and defective trees which should be removed; ways whereby farm and other consumers may get more and better service from wood at more reasonable costs; and provision of public credit to forest-land owners who will undertake to apply good practices to their forest holdings.

### Extension of Public Forest Resource

Much forest land, however, is submarginal for profitable permanent management by private owners. Public ownership and management of more forest land by counties, by the States, and by the Federal Government is often the best answer to this problem. It is also added assurance against exploitation and deterioration of the forest resource.

It may be good policy to extend public ownership and management to forest lands on important watersheds and to key tracts that might make it possible to shift dependent industries and communities from a transient to a permanent forest economy. This might shift 140 to 150 million acres from private to public ownership. It would still leave more than one-half of the commercially valuable forest land in private ownership. How far such changes should go, and how much forest land should be brought into county or State or Federal ownership, will depend in part on the rate of progress in forest management on privately owned land.

Additional facilities are necessary to protect, develop, and use the existing national forests, and such lands and resources as may be added to them. More research, both for private lands and for those that are publicly owned and managed, is needed. Forest management, like other phases of agriculture, stands now in a transition period, and changing practices must have the guidance of science.

Additional research should include investigations in: Growing and protecting the timber crop; improving logging and manufacturing processes and increasing utilization; flood control, stream flow and erosion control; management of forage, wildlife, and recreation; the extent and character of the forest resource, of forest drain, forest growth, and forest requirements; and the social and economic aspects of forests and forest management.

Special measures are needed in special-problem areas, such as the Pacific Northwest. This area contains the greatest and one of the last reserves of virgin timber in the United States. Within it, however, private ownership and excessively rapid and disorderly liquidation have created already an acute situation. The remnants of hardwood forests in the Lake States constitute another special-problem area. Still another includes parts of southern Illinois, Indiana, and Ohio, and along the Appalachian chain. Here the forests have been depleted; yet the opportunity for farming is limited. In many localities the soils have been worn out, the incomes of the farm people are unbelievably low, and the population exceeds that which can be supported by farming and all other occupations definitely in sight. But this region contains an enormous area of forest land, much of which could be restored to productivity.

## TOWARD BETTER ANIMAL HUSBANDRY

Research in animal industry continues to furnish growers with facts that enable them to produce more livestock at less cost and to overcome difficulties that formerly have caused loss and discouragement. In the Gulf Coast region, where diseases of obscure nature have hampered beef production, a survey of the cattle and grasses indicated that much of the range there is deficient in phosphorus. Well controlled research over a 3-year period showed that feeding phosphorus supplements, such as bonemeal and disodium phosphate, prevents "creeps" and other diseases associated with a deficiency of this element. In addition, the feeding of phosphorus compounds increases fertility in breeding herds and leads to more as well as heavier calves. Many breeders in the area described are already supplying bonemeal to their cattle in self-feeders and disodium phosphate in the water supply. On the basis of 1 million cows on phosphorus-deficient ranges in the Gulf Coast country, general use of the knowledge provided through research would increase the quantity of beef produced as yearlings by about 83 million pounds.

Other research has shown the necessity of adequate quantities of carotene in the feed of cattle, especially during periods of drought. This substance is the main source of vitamin A in cattle rations; a lack of it is responsible for many of the disorders that cause cattle to breed irregularly or to produce dead or weak calves. Previous studies showed the value of vitamin A in preventing night blindness, but the results of more recent research demonstrate that cattle require more vitamin A for successful reproduction than for prevention of night blindness. Providing feeds with sufficient carotene is especially important in the South, where cottonseed meal and hulls are fed in large quantities, and in the Middle West and Northwest, where cereal grains, straw, stover, prairie hay, and other feeds also are deficient in the necessary carotene.

Swine-raising investigations have directed attention to several methods of saving young pigs, many of which die from preventable causes. With the electrification of more and more farms, electric pig hovers assume increasing interest and importance. Experiments by the Department showed that about 5 percent more pigs were saved to 3 weeks of age in litters supplied with electric hovers than in those without the benefit of this device. An advantage of the hover, besides the warmth, is to attract the pigs away from the sows, with the result that fewer pigs are crushed to death. Pigs that had access to hovers for the first few weeks were 1.4 pounds heavier, on the average, when weaned at 8 weeks old than pigs not having access to hovers. The practice of feeding sows away from their litters likewise has saved many small pigs from being trampled or crushed by their mothers, and hog owners are reminded also of the desirability of using guardrails in farrowing houses to provide greater safety to young pigs.

Through research and its application the hatching of chicks and the production of poultry are much less dependent on the seasons than formerly. The replenishment of poultry flocks is now possible throughout the year, and the continuous production of poultry meat is also feasible at any season. The one essential for year-round production of poultry meat and eggs and out-of-season replenishment of flocks is an adequate supply of vitamin D. Because most of the imports of

cod-liver oil, a convenient source of this vitamin, have been stopped by the war, there has been fear that supplies of vitamin D in the United States would be insufficient. But chemical technology has provided a domestic source, 7-dehydrocholesterol, which is able to supply all the vitamin D required by the poultry industry of this country. When activated by ultraviolet light, this substance is an extremely potent form of vitamin D.

Also noteworthy in the conduct of the poultry industry has been a much greater efficiency in the use of feed through improved knowledge of both nutrition and breeding. Whereas it was formerly customary in the production of broilers to use between 7 and 8 pounds of feed for each pound of gain in live weight, the same result now is achieved with about 3 pounds of feed. Similarly, in producing 200 eggs the modern bred-to-lay hen utilizes only about 84 pounds of feed as compared with 150 pounds required for the same egg yield a quarter century ago. Through the influence of the National Poultry Improvement Plan, sponsored by the Department of Agriculture and 44 cooperating States, laying flocks that produce from 160 to 180 eggs of standard market weight annually per hen are becoming more prevalent. This production is in marked contrast to the estimated annual production per hen in the United States during 1940, which was only 101.2 eggs. The improvement has been accomplished largely through selection on the basis of production records and progeny testing.

## Veterinary Science Curbs Diseases of Horses

In view of the need for adequate farm power in the Nation's food program and horses and mules for military purposes, the Department has intensified its efforts to curb diseases of equines. The Remount Service and the Veterinary Corps of the War Department depend on the Department of Agriculture for information on disease conditions. Those units of the War Department make their procurement restrictions accordingly.

The malady known as sleeping sickness, or encephalomyelitis, formerly caused serious losses and discouragement to horse owners. The effects of this disease were especially serious because losses occurred principally during the busy summer and early fall months when ample power was imperative for cultivating and harvesting. The situation is now greatly improved. Research has provided intradermic vaccination as an excellent means of immunizing horses against the disease. This method has already been widely adopted. Official estimates show that about 1 million horses and mules received this type of vaccination in 1940. Favorable results from it have continued during 1941 with prospects that science has now conquered this troublesome malady to the extent that losses are only a small fraction of those previously experienced.

Late in 1940 the destructive infectious horse disease, dourine, was diagnosed in a stallion in Arizona. With the finding of a positive case, Department veterinarians immediately undertook to determine the extent of the disease. From the testing of more than 16,000 blood samples, of which about two percent were positive, dourine was found to exist or was suspected in parts of three Western States—Arizona, California, and Nevada, and especially on certain Arizona Indian

reservations. Positive cases of the disease are being destroyed and the outlook is favorable for early eradication. Animals in the affected area may be needed for army service and only healthy horses that have not been exposed to disease are desired. All horsemen are urged to familiarize themselves with this disease and lend their cooperation, when requested by veterinary authorities, to hasten the eradication work.

### Phenothiazine Effective Against Internal Parasites

Investigations with phenothiazine for combating internal parasites of livestock came to fruition near the end of 1940. The Department's research work showed conclusively that this chemical was effective, in small therapeutic doses for removing injurious and devitalizing internal parasites from cattle, sheep, and goats. Among such parasites were stomach worms, hookworms, and nodular worms. The same chemical was found to be the most effective remedy yet discovered for the removal from horses and mules of red, or palisade worms and related roundworms, which are as injurious to equines as hookworms are to human beings. The work of investigators of the Bureau of Animal Industry has been confirmed by workers elsewhere in the United States and abroad with indications that phenothiazine will become the most valuable treatment yet known for the removal of internal parasites from domestic animals. It is already being manufactured by leading chemical establishments and is widely distributed by dealers in pharmaceutical supplies.

### Added Protection to Swine Industry

As a further step in controlling hog cholera, a recent order of the Department provides closer supervision over the distribution of anti-hog-cholera serum, hog-cholera virus, and similar biological products made under Federal supervision. The order provides that distributors, as well as producers and importers, must keep permanent records of any veterinary biological product they handle. Improper use of some biological products makes them dangerous to the health of livestock. Some may affect man.

The interstate shipment of live virus and organisms receives special attention. Thus, the new regulation is a further safeguard to animal health and meat supplies. The Department also has continued to administer the anti-hog-cholera-serum marketing agreement and order, which involves supervision of approximately 184 handlers of serum and virus. To provide reserves against emergencies, the agreement requires that each producer must have in stock on May 1 of each year, a quantity of serum that totals at least 40 percent of each previous year's sales. On May 1, 1941, the amount on hand represented 60 percent of the total sales of all handlers for the previous year. This large reserve has provided, so to speak, an "ever-normal granary" or extra supply of serum for use in protecting this year's large hog crop.

The Department has aided swine owners also in controlling swine erysipelas. This is a serious disease in the Central West and has been increasing. The acute form causes mortality ranging from 10 to 50 percent of animals affected. In animals that survive, the disease results in retarded growth and joint deformities. A serum has been

used with some success in preventing swine erysipelas but it affords only temporary protection. It must also be used very early in the course of the disease to be of benefit. A newer so-called serum-and-culture method of protecting pigs against swine erysipelas is now being developed and has received practical tests with encouraging results.

### Suppression of Bang's Disease

The cooperative Federal-State project to eradicate Bang's disease continues to make excellent progress. This malady has long hampered cattle breeding. At the request of stockmen's organizations the Department now produces all *Brucella* antigen, which is a diagnostic agent used officially in testing cattle for the disease. Every step in the preparation of the antigen is closely controlled to maintain a high standard for the product. Veterinary officials consider that the test now in use for combating Bang's disease compares favorably in accuracy and general dependability with the tuberculin test, which was highly successful in the campaign against bovine tuberculosis.

Another forward step in the conquest of Bang's disease occurred in December 1940, when the Department officially recognized the vaccination of calves as an aid in cooperative Bang's disease control. The plan is based on the beneficial results obtained, in recent years, from large-scale vaccination of calves against Bang's disease under farm conditions as well as at experiment stations. The Department has authorized its veterinarians to cooperate with State officials in the use of calfhood vaccination, in addition to the test-and-slaughter method of eradication.

### Bovine Tuberculosis Campaign Reaches Goal

A noteworthy result of Federal and State cooperation during the year was the establishment of the entire United States as practically free of bovine tuberculosis. The attainment of this goal, which was anticipated in last year's report, brought the degree of infection in every county in every State to less than one-half of 1 percent. This is a culmination of the vision of many prominent veterinarians, livestock owners, and others who, in 1917, believed the task to be feasible in spite of doubts and opposition raised by persons who held contrary views.

In the 23 years, the vast enterprise involved more than 232 million tuberculin tests and retests. About 3.8 million tuberculous cattle were classified as reactors and removed for slaughter. Notwithstanding the achievement now announced, there is still need for continued retesting of herds, especially those from which tuberculous animals have recently been removed. Such retesting is necessary to safeguard the health of herds against possible infection. The practical eradication of tuberculosis in cattle has been hailed by both the medical and veterinary professions as a great aid in the fight against human tuberculosis, the bovine type of which is transmissible to man.

### Federal Meat Inspection

As usual in times of national emergency, additional responsibilities have gravitated to the Federal meat-inspection service. This activity,

conducted by the Department in nearly 700 meat-packing establishments, comes into prominence whenever economic or social disturbances, such as augmented imports or exports, drought, floods, or war, occur. The Nation's armed forces require large quantities of meat, and the Department's veterinary inspectors have aided officers of the War and Navy Departments in obtaining the desired kinds and quantities of inspected products. There have already been material increases in slaughtering, curing, and canning operations. This step-up in volume has necessitated double and triple shifts of inspectors. Notwithstanding these special requirements, the thoroughness of inspection is being maintained.

Owing to increased food supplies required by the Navy, the Department has increased its inspection personnel at several points, notably Pearl Harbor, T. H., and Key West and Jacksonville, Fla. Inspections of meat and products for Government agencies in the fiscal year 1941 exceeded 425 million pounds, which was nearly three times the corresponding quantity for the previous year.

## Livestock Quarantines Maintained

Especially during disturbed world conditions, constant vigilance is necessary to maintain the freedom of the United States from destructive animal diseases that cause great economic losses abroad. Among them are contagious pleuropneumonia, rinderpest, sera, and foot-and-mouth disease. The last is greatly to be feared because it exists over most of the world and because of the ease with which it may be transmitted great distances and the rapidity of its spread. Effective maintenance of Federal quarantines involves the inspection of all animals offered for importation and supervision and control over animal byproducts that may carry contagion. The importation of ruminants, swine, and fresh meats from specified countries is prohibited by law. This quarantine service requires unfailing watchfulness at all ports, to prevent the landing from vessels of any prohibited animals or products. The administration of such laws and regulations was effective during the year in excluding foreign livestock diseases with little inconvenience to the agriculture, industry, and commerce of the United States.

While maintaining quarantines, the Department supervised the importation of considerable numbers of purebred livestock under paragraph 1606 of the Tariff Act of 1930. This act makes the Department responsible for approving the pure breeding of animals which are offered for entry into this country and which subsequently may be used on farms or for military purposes. United States importers were able to get 99 head of Jersey cattle into this country from the Island of Jersey shortly before that island was taken over by the Germans in July 1940. These cattle constitute a valuable addition to breeding stock and resulting dairy food supplies for national defense. More than 200 Thoroughbred and Arabian horses from England and France have also been allowed free entry since the beginning of the war. A large number of these animals are suitable for raising horses for cavalry purposes.

Livestock officials of the Department have utilized opportunities to improve friendly relations with livestock and veterinary officials of various South American countries, Canada, Mexico, Great Britain,

and other countries by furnishing information and offering facilities for study and observation. The Department furnished several representatives of these countries with diagnostic agents and other materials likely to be of assistance in helping to solve their animal disease problems.

## SOILS AND PLANT RESEARCH

In plant and soils research the past year was fruitful. Many superior new strains and varieties of crop plants emerged from test plots and began to be useful under commercial growing conditions. Certain developments in this field bore closely on the defense efforts. The program to grow rubber in the Western Hemisphere got off to a good start. The trend toward wider and more efficient use of grasses and legumes developed into a Nation-wide movement. Work to improve the quality of our food plants from the standpoint of nutrition had increased importance. In the South, especially, efforts were made to develop a wider range of adapted varieties of vegetables. The Bankhead-Jones Vegetable Breeding Laboratory at Charleston, S. C., reported many valuable developments. Wise use of our water resources in the West and the effect on the Nation's agriculture of bringing in large new areas of irrigated farm lands were plant-science problems with defense aspects.

### Rubber Program Makes Headway

The cooperative Latin American rubber program is now well under way, with more than 2 million seedlings of the Hevea rubbertree growing in a dozen nurseries scattered throughout Central and South America. Many of these seedlings have already been budded to high-yielding, disease-resistant strains selected in cooperation with American rubber companies from their plantations.

When the rubber project was started in July 1940, the Bureau of Plant Industry and the 14 cooperating Latin American republics faced a multitude of problems. Three of the most urgent were to locate areas in Latin America suitable for commercial growing of the Hevea rubbertree, to begin propagation of millions of rubbertrees, and to start research that would serve as a guide to the whole undertaking. It was apparent that the new industry must be built upon strains of Hevea that are resistant to the South American leaf blight, a disease that kills the trees. It was also agreed that only high-yielding strains could be used if the industry is to compete with other rubber-growing regions of the world where labor is very cheap.

Although it is much too early to forecast results of research that has hardly begun, our scientists believe they can overcome the disease hazards by methods used for other crops. Research in this field is now in progress at four newly established field headquarters.

The rubber project has the cooperation and financial support of all of the tropical American republics and of several American rubber-planting companies. As planting material becomes available each cooperating country will supervise distribution of it within its borders. The program does not aim at eventual production of all the rubber imported by the United States, but it does look forward to assuring this country of a substantial part of its requirements. Moreover, the

program will improve the basis for mutual trade between the United States and the other American republics.

The United States is the world's biggest peacetime user of rubber. Its average annual imports of this commodity for the years 1937–39 were about 1,109 million pounds, of which only 1.6 percent came from Latin America. About 98 percent came from the East Indies, Malaya, and the vicinity. Before the present war we used about 60 percent of the world supply.

We are building up stocks of about 1,250 million pounds to protect ourselves in case war should disrupt shipments from the Far East. This supply is being obtained from Britain in exchange for textiles, from the normal reserves of manufacturers, and from the operations of the Rubber Reserve Company, organized by the RFC. The use of these stocks will be under a system of priority control. In normal times 80 percent of our total rubber importations is consumed by the automotive industry. On June 21, 1941, the Director of Priorities announced that rubber consumption was to be reduced gradually until, by the end of the year, it would be 80 percent of the March 1940–March 1941 average. Defense orders will be filled first.

Meanwhile, steps are being taken to develop sources of rubber in this hemisphere to take care of a large part of our needs. Generally speaking, there are three methods of increasing rubber production in this hemisphere:

(1) By increasing plantations of *Hevea brasiliensis*, the true rubbertree.
(2) By developing rubber substitutes—synthetic rubber, which can be produced from materials available in this hemisphere.
(3) By developing other rubber-producing plants than *Hevea* (distinguished from synthetic production in that such rubber would be pure latex, not a substitute).

All three of these methods are receiving attention, and considerable success is reported in all of them.

The United States Government, including the Department of Agriculture, is giving financial and technical assistance to the governments of Brazil, Costa Rica, Dominican Republic, Guatemala, Haiti, Honduras, Mexico, and Nicaragua, among others, in expanding rubber plantations. Possibly by 1947 we shall be able to obtain all our rubber from sources in these countries. Meanwhile, production is steadily increasing, and if war makes the high cost justifiable we may be able to secure greater quantities from the wild Hevea rubber trees which thrive in Brazil and elsewhere.

In the synthetic field, progress is encouraging. It is doubtful whether synthetic rubber will ever displace Hevea rubber under normal conditions, except in certain specialized uses, because of its cost. However, in an emergency in which cost is secondary to need, the production of synthetic rubber under formulas already perfected will be entirely practical. The Defense Plant Corporation has agreed to finance the construction of four synthetic-rubber plants, to be operated by four major rubber manufacturers. Current production of synthetic rubber is at the rate of approximately 19.6 million pounds a year, and it is under mandatory priority control. Incidentally, the synthetic material has certain advantages over natural rubber in the manufacture of fuel-tank linings, hose and tubing, gaskets, and certain other items.

Certain plants other than *Hevea* contain varying amounts of rubber. Among these are guayule and goldenrod, both of which can be grown easily in this country. An experimental plant in California is now producing about 10,000 pounds of guayule rubber per day. The product sells for about 20 cents a pound. There is little doubt that under pressure of emergency guayule offers an important recourse. Production can be expanded readily since the plant does not take long to mature, but under present economic conditions the cost is too high to justify large-scale production.

## Grassland Agriculture

The trend toward a grassland type of farming in America is a highly significant development. Grassland agriculture is a type in which grasses and legumes occupy a definite and regular place in the cropping system in harmony with suitable local farm practice. This trend has been discernible for several years in various activities aimed at farm adjustment to the aftermath of World War I. It began to take more definite form about 5 years ago. Today this movement to prevent depletion of our land is advancing widely.

Farmers and ranchmen in every section of the country have been meeting to consider grass and how best to extend its use. Other nations must plow up their grasslands to produce food for hungry, war-ridden populations. America can still sow grass. Without ceasing to be a granary as well as an arsenal of democracy, the country improves its grasslands. Further complications in international relations could modify or even reverse the trend toward more grass; but such an eventuality is not now in sight. This movement comes from a national determination to check the destruction or misuse of land and grass.

Restoration of grass in some areas is essential to the protection of land against excessive erosion. Improvement of the grass cover on watersheds is a safeguard against downstream disaster from upstream neglect. Grass, moved progressively through various field units in rotation with other crops, improves the physical structure of the soil, enriches its chemical composition, and stimulates beneficial biological activity in it. Moreover, good grass is good feed, and good feed is the basis of the livestock industry.

Intelligent grassland management is just as important as intelligent management of orchard land, cornland, or wheatland. Grass has cultural requirements that management must satisfy, just as management must satisfy the cultural requirements of corn, wheat, cotton, tobacco, or any other crop. Grassland agriculture is soil management in terms of grass; we must know grass species as we know wheat and corn; we must find or develop better varieties of grass. Research has already produced new strains by breeding.

Crested wheatgrass, introduced by the Bureau of Plant Industry, has been used in the Great Plains for reseeding millions of acres of abandoned land. Russian wild-rye, a new grass, is attracting favorable attention because it promises to lengthen the grazing period. Studies of pasture management in the northern Great Plains show that the most economical livestock gains are made when livestock are grazed on cultivated grasses in the spring and fall and on native range in the summer.

In the southern Great Plains buffalograss is the most important native species. Its seeds, however, are borne very close to the ground. It has consequently been almost impossible heretofore to harvest buffalograss with machinery and get enough seed to plant large areas. Plant breeders have succeeded in adding inches to the height of this grass. Seed of the new selections may be harvested by implements in common use. Another handicap of buffalograss has been a difficulty in getting the seed to germinate promptly so that it can benefit from brief periods of ample soil moisture in the spring. This problem has now been solved. Soaking buffalograss seed in water for a few hours breaks the dormancy always associated with it.

In the Southeast, cooperative State and Federal research has developed a superior strain of Sudan grass that is more resistant to diseases and more vigorous than ordinary Sudan grass. An upright-growing species of Bermuda grass that has yielded 2½ tons of hay per acre is another promising development for this region. Because of its upright growth this new grass does not crowd out other grasses in the mixture, as does the common creeping form of Bermuda.

Research on the improvement of legumes has kept pace with research on grasses. A new strain of alfalfa with excellent resistance to bacterial wilt has been tested in 40 States. Within the next year or two a sufficient quantity of seed will be available for introduction to the trade. Two new strains of red clover, each superior in important respects, were introduced this year. Two new strains of sweetclover, Madrid and Spanish, have proved to be superior to other strains commonly grown in the Great Plains and have been distributed. Thirty-two new strains of soybeans that do not shatter their seed are now under field test in the South. The most promising will be increased for distribution.

Increased planting of grasses and legumes backs up our defense efforts. These crops play a vital part in the production of many urgently needed nutritious foods. They make it possible for farmers to grow their own nitrogen in the form of legumes; they require less labor on the farm; they will be useful in adjusting American agriculture to post-war conditions. Animals that graze pastures and eat good grass silage are healthier and more productive. They supply the butter and other products which are higher in vitamins. Grasses and legumes also lower livestock-production costs. Efficient production of milk, butter, beef, pork, and other animal products requires liberal use of grasses and legumes. Cost records show that milk can be produced on pasture for about half the cost of producing it in the barn. The same relative advantage applies to other classes of livestock.

Under the National Defense Program the munitions industry will demand considerably more nitrogen. Some of the new plants being built to manufacture synthetic nitrogen will not come into production until next year, and few ships are available to bring nitrates from South America. Farmers can aid the defense program by growing as much as possible of their nitrogen fertilizer right on the farm. Legumes provide the means. Grasses and legumes also release manpower from the farm for direct defense activities, since these crops require less labor for cultivation and harvest.

## Breeding Better Vegetables for the South

Research in agriculture, particularly in horticultural crops, has not been directed only to the development of crops and processes for the commercial producer, the shipper, and the dealer. It has had regard also for the consumer and the home gardner. For many years there has been emphasis on the need for higher quality products, that will give the consumer the most nutritious and valuable product that he can afford. Efforts have been made also to develop varieties that will better withstand adverse growing conditions, that will extend the season of harvest, and that will give improved products for canning, freezing, and storing. These requirements are quite as important for the farm and the town home gardener as for the market grower and shipper. The quest for earlier, hardier, more productive varieties has improved the supply of home-garden fruits and vegetables as well as the supply shipped to market. Better storage sorts keep better in home cellars just as they do in commercial storage. Disease-resistant varieties thrive in home gardens no less successfully than in commercial fields.

Some highly productive old garden varieties have disappeared; new ones of superior quality have displaced them. Some very high-quality old varieties have disappeared because of their susceptibility to disease. These changes have sometimes come about so rapidly that it has not been possible to develop all the desired characters in the new varieties. A new high-quality disease-resistant sort may prove less productive than its forerunner in some places. Frequently, old varieties lose out from disease before new ones have been developed to take their places. Many areas now in serious need of good home-garden varieties will benefit from the development of varieties especially suited to their own needs. This is the situation in the South, where the open winters make it possible to have fall and winter gardens. The South's hot, humid summers and relatively mild winters, however, favor the development of numerous vegetable diseases. So far we have not had enough varieties that are sufficiently adapted in this section.

The Regional Vegetable Breeding Laboratory, at Charleston, S. C., was established to meet this need. It operates in cooperation with the 13 Southeastern States and is now working on the improvement of 6 of the most important garden crops of the South. Immediate objectives are the development of: (1) Cold-hardy, disease-resistant, high-yielding, high-quality garden peas suitable for winter and spring culture through a large part of the South; (2) varieties of tomatoes resistant to wilt and to the leafspot diseases, that will bear over a long period instead of losing their leaves—thus having their fruits ruined by the sun—and then dying soon after the first fruits begin to ripen; (3) prolific and tender green and wax snap beans that can stand heat and the attacks of diseases that usually ruin them early in the summer; (4) high-yielding, tender, sweet corns that are resistant to the corn earworm and to disease; (5) varieties of cabbage that are hardier to cold and to heat than our present kinds and which will not shoot to seed instead of making good heads after cool weather; and (6) disease-resistant watermelons with higher sugar content and better eating and keeping qualities.

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In this breeding work thousands of determinations are being made of sugar content, tenderness, keeping quality, and vitamin content. Efforts are being made to develop varieties that are not only productive and pleasing to eat, but which are richer in food value and vitamin content. This is probably the first definite large-scale effort to breed varieties higher in vitamins. Already there are indications of success. Selections of cabbage with increased vitamin C are being tested, and workers in Louisiana have sweetpotatoes with more vitamin A.

Numerous lines of large-podded market types of garden peas resistant to diseases and cold have been released to cooperating experiment stations for adaptability trials and final selection. Frost or freezing damages the blossoms and young pods of these peas, but temperatures far below freezing failed to damage the leaves or stems; at normal growing temperatures the plants immediately resumed their growth, formed new flowers and pods, and set a late crop. Common varieties in the test were completely destroyed.

A large number of heat- and disease-resistant progenies of snap beans apparently better adapted to the South are being increased to provide supplies for widespread distribution in 1942. These have shown the capacity to set pods of good quality under temperature conditions that were disastrous to common kinds. They are also resistant to common bean mosaic.

The new Pan America tomato, although not developed specifically for the South, gives promise of doing well there. It combines the high quality and productiveness of Marglobe with high resistance to fusarium wilt, a disease widely prevalent in the South.

## Agricultural Aspects of Current Irrigation Projects in the West

Large expansion of construction work for the storage and distribution of the water of streams in the western United States has gone forward during the last decade. It has involved not only such large projects as Boulder Dam on the Colorado River, the Columbia Basin project in Washington, the Central Valleys project in California, and the Fort Peck project in Montana, but also many smaller projects located in nearly every one of the 16 Western States.

These huge dams represent but a part of the program for the better utilization of our water resources. The whole job involves land use planning in all its aspects. Watershed protection, flood control, prevention of soil erosion and the silting of reservoirs, power for cities, and water for farmers, are the results of wise planning. Most of these subjects are discussed elsewhere in this report, but the use of water in crop production deserves special consideration at this point.

Taken as a whole these construction projects will involve an increase of 3 to 4 million acres of irrigated land or of 15 to 20 percent of our present irrigated acreage. This fact calls for the consideration of the impact on our economy of these extensive new irrigated areas. What crops will be grown on these lands? How will these new contributions of crops react on the economy of existing sources of crop production? What reciprocal effects will these new

production areas have as markets for the products of nonagricultural industries? In what ways may they be mutually beneficial in respect to the existing agriculture of the surrounding dry farms and livestock ranges and to existing or prospective nonagricultural communities and industries? In seeking answers to these questions it seems appropriate to review the experience of the past 30 years, during which there has been not only a large increase in the area of irrigated land but what is even more significant, a marked intensification and specialization of irrigation agriculture.

One of the outstanding economic features of irrigation agriculture in the last 30 years has been the growth of mutually profitable relationships with surrounding and adjacent enterprises. For example, the existence of an irrigated area in the midst of extensive dry farms and range lands has provided a local refuge during the recurring periods of drought and a center from which the dry farms and the ranges could quickly be reoccupied with the return of favorable seasons. Furthermore, the irrigated lands have become local centers for wintering and fattening livestock from the ranges and local markets for cereals from the dry farms. Manure from these feeding operations has contributed to the high productivity of irrigated soil, which is essential to profitable irrigation farming.

Another outstanding feature of irrigation agriculture has been the trend toward crop specialization. Some of these areas have such favorable soil and climatic conditions that with a controlled water supply it is possible to produce certain vegetable and fruit crops so cheaply and of such high quality that they may be profitably distributed throughout the entire country. For example, such widely grown crops as lettuce, carrots, cantaloups, apricots, cherries, and peaches, to name only a few, are now supplied to the whole country from irrigated lands. This trend toward crop specialization and country-wide distribution has benefited all consumers both in the improved quality of the products and in longer seasons of availability. The consequences in improved general health and well-being, though not definitely measurable, have surely been very great.

Moreover, each new irrigated area stimulates the national economy by providing new homes and opportunities for an expanding population. It provides new markets within our borders for the products of industry and opportunities for persons engaged in providing health services, education, and entertainment as well as distribution. These are all the usual effects of an expanding irrigation agriculture in regions hitherto sparsely occupied. They benefit the country as a whole. Sometimes, to be sure, they involve local and temporary dislocations and stresses, but there is no evidence as yet of serious economic or social dangers along this road.

It is not possible to forecast what crops or what types of livestock will become dominant in any new irrigated region. These are matters that are subject to continuing experimentation and are influenced not only by local conditions of climate, by soil, and by individual preference, but also by the prevalence of parasitic insects and plant diseases. In general, it may be assumed that on the northern projects in the midst of extensive range lands, various types of livestock production or feeding will become established. With an assured water supply, abundant yields of forage crops may be expected to support

breeding and feeding operations. On many projects the production of sugar beets, potatoes, and beans should find an important place. Fruit and vegetable crops for shipment or for canning are potentialities under suitable conditions. Cereal crops, except for local use, are not to be expected to find an important place.

Irrigation farming is a special art. In addition to all the requirements for ordinary farming it calls for skill in the distribution and application of water to the land. This skill is acquired chiefly by experience, sometimes long and painful. The labor costs of irrigation, together with the cost of the water, represent a large part of the production costs of irrigated crops. Consequently yields must be high and must be maintained through the years. These higher yields in turn demand higher levels of plant nutrition than would be adequate for dry farming. Experience has shown that sustained soil productivity under irrigation calls for more fertilization than is needed in farming with limited rainfall. Furthermore, the soil conditions favorable to luxuriant crop growth are also favorable for parasitic soil organisms, and in older irrigated regions these become an important problem.

It should be pointed out, too, that irrigation farming is subject to many of the same hazards that beset ordinary farming. Even the hazard of drought due to water shortage is not always eliminated. Windstorms, hail, and local torrential rains have to be expected in many regions. Occasionally epidemics of plant diseases and insect pests may be even more serious in desert areas than elsewhere. During the earlier years of irrigation development living conditions may be trying. In some irrigated regions the problems of an acceptable domestic water supply may be serious. But, notwithstanding such hazards, the fact that irrigation farming has, through the years, become an increasingly important part of our national economy may be taken to indicate good prospects for the current expansion.

## RURAL ELECTRIFICATION

During the fiscal year 1941, REA-financed systems continued to advance the program of rural electrification as rapidly as possible. On June 30, 1941, allotments totaled $369,027,621. Full development of the systems for which these allotments have been made will provide electric services to approximately 1,171,867 rural consumers and serve a population in excess of 5½ millions. At the close of the fiscal year 732 of the 823 borrowing organizations had energized part or all of their lines and were serving 780,933 farm families and other rural users. This is in contrast to a total of 549,604 rural users on the same date in 1940; 268,000 in 1939; and 104,528 in 1938.

On June 30, 1941, there were 307,562 miles of line energized and in operation. Miles of line under construction totaled 48,848, and this construction was 48.6 percent complete. Thus the weighted miles constructed as of June 30, 1941, was 331,300 miles, in contrast with 241,493 miles in 1940. Construction during the year averaged 7,484 miles a month financed by a monthly advance of funds to borrowers of $6,258,988. At the close of the fiscal year, total advances of borrowers amounted to $296,395,142.

All suppliers of electric energy in rural areas—REA-financed systems, private utilities, and public and cooperative systems financed

otherwise than through the REA—were serving 2,126,150 farms on June 30, 1941. This total, comprising 34.9 percent of all of the farms in the United States, contrasts sharply with the 750,000 farms—only 10.9 percent of the total—that were being served on January 1, 1935, 4 months before the Executive order of May 11, 1935, established the Rural Electrification Administration.

Gross revenues of cooperatives and public power districts financed by the Rural Electrification Administration increased 68.9 percent, from $17,234,818 for the fiscal year ended June 30, 1940, to $29,109,691 for the fiscal year ended June 30, 1941. Kilowatt-hours billed increased 82.0 percent from 307,668,000 kilowatt-hours for the fiscal year ended June 30, 1940, to 559,805,000 for the fiscal year ended June 30, 1941. Line losses and average rates per kilowatt-hour decreased materially during the period.

The REA continued its efforts to keep down and further reduce the cost of electric service to rural America by improved technique and advanced technology. This realistic price approach to the problem of rural electrification has not only resulted in lower costs of electric energy in rural areas but has substantially reduced the cost of wiring, plumbing, appliances, and other devices through which electric energy is put to work and which materially affect the over-all costs of applying electric energy to farm and home activities. Efforts to reduce costs of electric energy in rural areas by further improvements in transformers, substation equipment, line construction, maintenance and operation, and appliances and machinery used on farms—as well as to increase the productivity and income of the farm through the use of electric energy—continue with every indication that the successes of the past 5 years will be repeated in the future.

## REA and National Defense

The importance of power, particularly of electric power, to industrial production and to national defense has long been recognized. Its relation to agricultural production and to the development and utilization of rural areas in the United States, however, has only recently become manifest. The need for electric energy for light and power in rural areas in order to maintain agricultural production, to convert productive capacity into critical foods or other necessities, and to supply directly the electrical needs of many modern military establishments has recently become a problem of immediate importance.

The agricultural needs for electric energy to assist in fulfilling its part of the National Defense Program hinge on the problems of labor supply and the increased demand for protein and other critical foods for domestic consumption as well as for people whose sources of these foods have been dislocated or destroyed by war.

During periods of national emergency, agriculture must meet an enhanced demand for its products with a greatly diminished labor supply. The normal supply of farm workers is reduced by men entering the armed forces and by men and women migrating to industrial centers to assist in expanding industrial output. With the defense effort barely under way the index of farm-labor supply has declined from 100 in April 1940 to 82.2 in April 1941. More important

than the average decline, however, is the acute shortage in dairy, poultry, and truck-crop areas where the critical foods are produced. Increased production of these foods is necessary to advance the standards of nutrition in order to improve the health, morale, and productivity of the general public. The farm plants in the United States must adopt modern methods to meet the situation.

It is now known that certain European nations, in planning for maintainance of their basic food supplies and for the achievements of maximum productive capacity, advanced rural electrification as one of the basic steps in their preparation for total war. As early as 1935 Germany had electrified 80 percent of its farms and was rapidly completing its program of 100-percent electrification. The growth of rural industries was encouraged as were small power and shop developments on farms. Rural uses of electricity were increasing rapidly. According to reports from German sources at the Third World Power Conference in Washington, D. C., in 1936 rural electrification "was adopted to assure the subsistence of the German people on the produce of their own soil and to prevent the 'flight' from rural districts to larger cities" and rural electrification "was made possible only because industry and agriculture have cooperated closely, and because the Government has shown great interest in the solution of the problems encountered and has energetically assisted." In developing its economy Germany leaned heavily on the development of its electric-power resources.

Electric energy on the farm contributes immediately and directly to the solution of the farm-labor problem and to the increase in the production of protein and other critical foods. Electricity in the farm home, in the dairy, in the poultry yard and about the farm buildings provides the "labor" needed to care for the daily peak load created on the average farm by these activities. It increases the farm working day and frees labor for other employment and for expanded farm activities.

Poultry raised in lighted houses feed longer, grow faster, and produce more eggs. By the use of electric energy in brooders and in lighting brooder and hen houses, poultry and egg production can be increased at least 25 percent without increasing the labor or other physical equipment involved. Electric milking machines, cream separators, coolers, and related dairy equipment double the size of the herd which can be serviced by an individual farm worker and reduce the physical effort required for the job. Electric appliances within the home, such as washing machines, irons, and other devices, free the housewife for work in the dairy, poultry yard, and garden. Mechanical water pumping for dairy, poultry yard, garden irrigation, and other farm uses greatly increase production and reduce labor. In farm buildings, in the farm shop, in feed grinding, in refrigeration, in pig brooding, and in many other uses electric energy reduces waste and losses, increases the working day, saves labor, and increases output. Farm products, particularly milk for use as whole milk or for cheese, condensed milk, powdered milk, ice cream, chocolate and other manufactured dairy products, eggs, vegetables, etc., must be kept fresh and electric refrigeration is the most economical and effective method of accomplishing this result.

Meeting the increased demands for the critical foods—milk, butter, cheese, eggs, meat, fats, and vegetables—requires that the techniques for expansion be made available to many farms. The farm plant is a small-scale business, and it is impossible to increase over-all production materially unless a majority of the farms participate. Efforts must be generalized, not concentrated in a few centers or on a few producers. The following tabulation compiled from the United States Census of Agriculture for 1935 indicates the situation regarding the average production of selected protein foods:

| *Item* | *Cattle* | *Milk cows* | *Chickens* | *Swine* |
|---|---|---|---|---|
| Percent of all farms included | 80.5 | 76.9 | 85.6 | 58.3 |
| Average number per farm in United States | 12.5 | 4.7 | 64.0 | 9.4 |
| Highest State average number per farm | 117.4 | 11.6 | 214.0 | 31.3 |
| Lowest State average number per farm | 3.2 | 1.7 | 25.0 | 2.9 |

Approximately 92 percent of the farms with dairy herds have less than 10 cows and other production is distributed proportionately. The increased demand for protein and vitamin foods can be met only by the widest distribution of electric service in rural areas.

Electric energy applied generally to the average farm, with an investment less than the annual wage of a farm laborer, will provide the equivalent of an additional farm hand. Farm chores, through which protein and vitamin foods are largely produced and preserved, can be expanded by the individual farmer without the necessity of securing additional labor, and farms now using several laborers can release labor for other defense purposes while expanding their production of critical foods. Electric energy on farms will conserve essential foods and will make it possible to expand production in spite of a reduction in the supply of farm labor.

## REA Service for Defense Establishments

The REA through its cooperative organizations in over two-thirds of the counties in the United States has made electric power available to many military establishments. Service has, also, been made available to enterprises engaged in the production of strategic materials and other products essential to defense. Already the military establishments alone have necessitated the construction of generating plants, substations, transmission and distribution lines to furnish a total firm capacity in excess of 35,000 kilovolt-amperes and the indirect requirements have run many times that amount. REA-financed systems have been called on to serve military camps, bases, forts, depots, dumps, and housing projects; several mercury, vanadium, and other enterprises producing essential raw materials; and a large number of airports, landing fields, air beacons, radio beams, and many lessor loads related directly to the defense program. The increasing tempo of the defense program indicates clearly a substantial increase in the demand for electrical power for these vital activities from every section of the country.

Because of the fact that modern military bases require large sites with varied terrain, many of them have been located in areas removed from centers of specialized agricultural production and ordinary commercial activities. In such instances special efforts are needed to develop adequate supplies of perishable foods and "service" facilities.

The demand for farm products in the rural areas surrounding such defense projects has become immediate and acute. The production of protein foods including eggs, vegetables, dairy products, pork, and beef has been increased wherever electricity is available. Although the present crisis has worked hardships in some directions, it has brought an opportunity to many farms and rural areas to rehabilitate and modernize their farms because of the increased demand for their products as well as for housing and rooming facilities caused by the influx of population in the defense area.

REA-financed systems have been called on to distribute electricity throughout rural areas surrounding many camps and national defense projects. The effect of a large defense industry or army camp is felt in many counties surrounding that industry or camp and the demands for materials to build extensions to unserved farms have been and are being intensified in practically all rural areas of the United States. In addition, the construction and operation of any defense project calls for all the available labor in the area, thereby making mandatory the use of farm machinery and electrically driven equipment for increased food production.

The existing REA-financed systems have been and are being requested to increase their service facilities to provide electric power for rural housing, filling stations, commercial establishments, and recreational facilities, in addition to the increased farm requirements in areas surrounding military camps and defense projects.

Surveys of industrial enterprises served by REA-financed systems show that an increasing number of industries is being located in rural areas in every State. Electric power is vital to the operation of these enterprises, and it is apparent that a further extension of such service into rural areas will result in a corresponding increase in the productive capacity of these small processing plants and decentralized industries. Among those industries are cold-storage plants, hatcheries, dairies, food-processing plants of many types, mines, oil lines, aluminum plants, building-supply plants, machine shops, textile mills, and chemical industries. During 1940 there was a 20-percent increase in the types of industries on REA-financed lines, a 53-percent increase in the number of plants, and an 86-percent increase in the kilowatt demand of such industries. During each of the first 6 months of 1941 an average of approximately 50 additional enterprises with total demands exceeding 3,000 kilowatts requested service from REA-financed systems.

Notable in this connection is the development found in the Shenandoah Valley by the Shenandoah Valley Defense Council organized as a cooperative to enable the small industrial plants in the area to assist in the National Defense Program. The Valley has never been an industrial area. It is predominantly a farming community with its 125,000 inhabitants scattered over 2,000 square miles of land. Over 20 percent of the inhabitants live on farms and the remainder in a number of small communities. In spite of its rural character the valley was found to offer industrial resources surprising in number and variety. In more than 40 small machine and repair shops were found over 375 engine lathes, electric welders, milling machines, power presses, and other machine tools. The machinists who operate this equipment migrated to industrial centers during the boom periods and learned their

trades. Dissatisfied with living conditions in urban centers or desiring the security of rural life they returned and settled in the valley. Their gardens and farms provide their basic living and they work in the machine shops as occasion arises. To meet the needs of national defense they and their neighbors, trained at home, plan to run the machines on full production schedules while their families maintain agricultural output and preserve their basic economic security and desirable living conditions. Production in this manner can be greatly expanded without the attendant evils, both present and future, of boom-town development or congestion in urban centers.

REA and REA-financed systems are working to avoid and to alleviate power shortages at critical points in the defense program. Mobile power units of various sorts are being developed or acquired for rapid movement to areas where power shortages have threatened the defense program. By a planned development of decentralized generating plants with mobil units to care for break-downs or sudden increases in demand, the REA expects to develop a power-supply system which is sufficiently flexible to meet all requirements and provide the maximum protection against sabotage or other assaults on the national power supply.

## CHEMISTRY AND ENGINEERING IN DEFENSE

Chemists and engineers in the Bureau of Agricultural Chemistry and Engineering attack together a great variety of problems in farm production, in the protection of crops from pests, in transportation and storage, in processing, and in the utilization of crops by industry and by the individual consumer. The results have important defense applications.

With four new regional research laboratories provided for by the Congress in 1938 and recently built and equipped for research in the industrial utilization of farm products, the Bureau is now able to work more effectively than ever. These new facilities, together with the laboratories previously established at Washington and at the various field stations, help to solve many urgent problems, as well as to carry on long-time research projects.

Engineering requirements of crop production, such as tillage machinery, fertilizer-distributing machinery, equipment for applying insecticides and fungicides, and planting, cultivating, and harvesting machinery, receive the attention of the agricultural engineers. They also study farm structures and equipment of various kinds for the storage, transportation and refrigeration of farm products, and for the utilization of electric power on the farm. The processing of farm commodities, such as the ginning of cotton, the preparation of fiber from flax, the dehydration of fruits and vegetables, and the preparation of various derived products, such as juices and other fruit preparations, starch from sweetpotatoes and various useful things from soybeans, receive the attention of both agricultural engineers and chemists. Many of these activities require also the work of bacteriologists, enzymologists, and other specialists.

Among the accomplishments of direct value in defense are contributions to the improvement of camouflage materials and methods, demonstrations of the usefulness of certain agricultural materials for

direct war purposes, such as the making of smokeless powder and protective helmets for civilian defense workers, improvements in equipment used by fighting forces, and foods better adapted for use under exacting conditions of transportation and storage, such, for example, as dehydrated vegetables. Other research results in this category contribute indirectly to defense. Examples of this type are new methods and equipment that make certain farm products sources of good substitutes for imported materials now not readily obtainable; improved ways of turning out food products useful in maintaining a high standard of nutrition; better storage methods and structures for food products; more economical production and processing of fibers; procedures that save fuel oil in house heating; more efficient processing of turpentine and rosin; possible new sources of vegetable oils; and ways of increasing commercial production of soybean protein as a substitute for other proteins.

### Dehydration and Other Ways of Preserving Foods

Considerable improvement resulted in methods and equipment for dehydrating vegetables from research by chemists and other scientists in the Department during World War I. Investigations in that field have recently taken on new life. Food industries, as well as research organizations, have tried out previous findings and forged ahead. Dehydrated foods are of the highest military importance. To develop more efficient processes of manufacturing and packaging them, research men are working on a high-pressure program at the Western Region Research Laboratory. They seek methods whereby dehydrated vegetables can be put up so they will have better flavor and better texture and will retain more of their vitamins. At the request of the Army and the Navy, the investigators are giving special attention to tomatoes, onions, potatoes, sweetpotatoes, carrots, leafy vegetables, and green peas.

Less concentrated foods, processed so that they may be consumed with little or no further preparation, contain some water. Hence they must be sterilized with heat and packed in airtight containers to keep out micro-organisms. So-called tin cans, really made of tin-coated sheet iron or sheet steel, are the best known containers for such foods for Army and Navy use. But this country imports practically all of its tin. The war may cause a shortage. Priority in the use of food containers made of tin plate must be given to food intended for the armed forces. There may not be enough left for packing foods for the civilian population, which in consequence will have to depend more on sterilized foods packed in glass containers or in metal containers not coated with tin.

In many communities civilians will probably be supplied with largely increased quantities of frozen fruits, vegetables, and meats in containers other than tin cans. Such foods will keep for a long time if they are stored in the frozen state at very low temperatures. Food chemists and technologists of the Department are giving much study to the conditions necessary for obtaining and maintaining high quality in foods packed by the quick-freezing process. They are investigating the effects of various factors in controlling the micro-organisms in frozen foods, and various means of preventing or miti-

gating deteriorative changes due to enzymes naturally present in the foods.

Studies of rancidity in vegetable oils have enabled the Bureau to make recommendations with regard to the packaging of butter, lard, bacon, certain salad oils, potato chips, nut kernels, crackers, and many other food products that contain fat or oil. Methods are available that will retard and minimize rancidity in such foods. Chemists are endeavoring to stabilize refined edible soybean oil so that its flavor will not revert to that of the unrefined product. Chemical and nutritional research on proteins has enabled the Bureau to indicate how various protein foods and protein-containing foods may be combined so as to give proper proportions of the nutritionally essential amino acids. Study of the effects of different storage conditions on the proteins of grains and other seeds and their milled products is yielding valuable results, especially in connection with plans for the long-time storage of cereals and cereal products.

### Research on Fibers, Hides, and Skins

There are many other ways in which current research on carbohydrates, fats, proteins, enzymes, allergens, miscellaneous minor plant constitutents, cereals, eggs, fruits, and vegetables, is helping the defense program. Microbiological and pharmacological studies are also contributing. Research on inedible agricultural products, such as plant and animal fibers and hides and skins, has notable defense value. Such products not only provide clothing for the armed forces, but also enter into many items of defense equipment. The Department's research is dealing, for example, with problems of making leather footwear more resistant to water and of preserving all types of leather goods without impairing the qualities for which leather is most desirable. Because the United States is heavily dependent on foreign sources for leather making materials, shortages could develop of the most needed kinds and qualities of hides and skins and of tanning and finishing materials. The Bureau's research on hides, skins, leathers, and tanning materials can help to develop substitutes.

The research on cotton relates to its defense use in many ways. One problem is the nitration of cotton lint for the manufacture of guncotton and smokeless powder (nitrocellulose). Cotton linters, commonly used for that purpose, may not be available in sufficient quantity. The much greater length of cotton lint introduces mechanical difficulties into the manufacturing processes, interferes with the chemical reaction, and results in nonuniformity of products. Some of the difficulties have already been overcome. Machines have been developed, for example, for cutting cotton down to a suitable length for the nitration processing. Another problem is the fireproofing of cotton bales intended for use in stopping bullets and shell fragments. This use seems possible. Preliminary experiments have shown that cotton in the form of low-density bales has the remarkable property of stopping pistol and rifle bullets.

Other inedible products from agricultural materials are needed by industries that produce supplies for the Army and Navy or articles that may be used as substitutes for foreign products. Among them are turpentine, rosin, American tung oil, fractionated soybean oil,

sugarcane wax, sweetpotato starch, sorgo sugars, fermentation products, and protein and lignin plastics. The Bureau's research deals with the utilization of all these products.

### Progress in Farm Machinery

Recent work by engineers in the Bureau has influenced the development of farm machinery. Improvements in equipment used in sugar-beet production include better planters, blocking or thinning equipment, and harvesting and loading machines. These improvements ease the work load on a crop that has been notorious for the amount of "stoop" labor required. The new single-seed-ball sugar-beet planter uses only 12 pounds of seed to an acre, compared with 20 pounds used by the old-style planters for the same stand. In addition to the saving in seed, the more uniform distribution of stand as single plants, rather than as two or more together, saves labor in thinning. The improvement of methods and equipment for the placing of fertilizer for row crops of many kinds is saving fertilizer and at the same time increasing yields. Manufacturers are already turning out many improved distributors for placing fertilizer in bands, including one-mule machines which should be of great value to small cotton growers.

Better spraying and dusting equipment, such as wheelbarrow sprayers and dusters and power dusters, are making the control of plant pests more efficient at a time when crop losses must be avoided wherever possible. Manufacturers are improving their machines as a result of the Bureau's findings. The investigations have also contributed toward the improvement of the dusting and spraying materials themselves, because they have shown what physical properties promote uniform distribution and adherence.

Technochemical work on sweetpotatoes, which resulted in the production of high-quality white starch usable in place of imported tropical root starches, has led to work on the development of mechanical equipment which promises greater economy not only in making the starch but in growing and harvesting the crop. New field equipment includes a two-row-trailer unit, for use with a tractor, with attachments for bedding, fertilizing and setting plants, and two types of sweetpotato diggers, one being suitable for small-scale growers. Byproducts of the starch process are being developed for stock feed and efforts are being made to produce nonperishable stock feed from sweetpotatoes direct. A search is under way for a method of storing the raw material so starch plants may operate the year round. Such developments as this starch process are of high importance in meeting situations brought on by the interference of war in world commerce.

Of recent assistance in increasing dairy production has been the use of grass silage. The Bureau, in cooperation with the New Jersey Agricultural Experiment Station, has obtained information on the need for strengthening silos for holding this new feed and on equipment and methods for harvesting the grass crops and putting them into the silo. Silos for grass silage must have considerably more strength against bursting than those used for corn silage.

In efforts to reduce power consumption or fuel requirements in working the soil and to increase efficiency in producing crops, the

Tillage Machinery Laboratory of the Bureau at Auburn, Ala., has carried on many experiments both in its soil tanks and in fields. It has learned, for example, that sharpening disks of disk harrows cuts power requirements materially. Studies of different types of plows have shown that disk plows require more draft per square inch of furrow slice than the moldboard plow, which is contrary to the common belief. A plow equipped with a special jointer and weed hook promises help to the one-mule farmer who seeks to improve his soil by turning under legume crops.

Since the leaves of such hay crops as clover and alfalfa make up the most nutritious part of the hay, haying equipment that will more effectively conserve the leaves adds to meat and milk production. A better side-delivery hay rake is a Bureau contribution of this sort. It is an outgrowth of work on machines for raking cornstalks in areas where the control of the European corn borer is a problem. The new rake, as one description says, does its work "with less shock and shatter."

Studies of machinery and methods of corn production have developed improved equipment for cultivating drill-planted corn which should aid materially in the cultivation of corn planted on the contour as a means of controlling soil washing. Promising improvements have been made in the husking rolls of mechanical corn pickers.

Increased attention to the problems of fiber-flax processing, brought about in part by the war which has pushed up the price of domestic flax at least 50 percent, has resulted in expansion in fiber flax acreage and mill capacity. To produce better fiber and reduce the cost of harvesting and processing, the Bureau has been carrying on research in Oregon, the principal fiber-flax-producing State. Already improvements have been developed in the design of pullers, deseeders, scutchers and tow shakers. The new scutcher promises to increase the yields of fiber and cut waste.

There has been a noticeable tendency on the part of cotton-gin operators and manufacturers of ginning machinery to take advantage of the results of research at the Department's cotton-ginning laboratory. Recent work in this field has conclusively demonstrated various ways of economizing on power and time in ginning and has improved methods and equipment so as to better preserve the quality of the fiber while increasing the turn-out of lint.

Increased attention to the growing of long-staple cotton in this country has stimulated studies of roller gins necessary in ginning long staple and a number of improvements have resulted, including a self-grooving roller and a new lint doffer which improves roller ginning efficiency and turns out smoother lint. Special studies of the handling of cotton between the gin and the mill show possibilities of saving by compressing cotton finally at the gin rather than at the compresses at marketing centers. Recent tests give indications that loosely woven cotton bagging as cover for cotton bales is withstanding weathering better than other types of bagging such as jute, burlap, and other weaves of cotton.

The studies of farmhouses and other farm structures have recently provided new facts on more economical building and maintenance; new designs for various structures, including storages; and, what is of special importance this year, ways of reducing heating costs.

### Heating, Storage, and Electrification

Studies of house heating have shown that by the use of flue-gas testers house-heating oil burners can be so adjusted and tightened as to reduce fuel consumption by one-eighth. The Bureau's engineers have also demonstrated that by burning fuel at a lower rate, even though for more hours, less oil is needed to maintain a comfortable temperature. For example, an eight-room house will be more economically heated by firing at the rate of 1 gallon an hour rather than at the rate of 1½ gallons an hour. Other contributions to the same ends, economy and comfort, have resulted from studies of insulation, weather stripping, storm sash, the use of curtain walls under houses without basements, and ventilation. Research on farm-house construction for the South has shown that cottonseed hulls can be used effectively for insulation.

Another oil-saving development is likely as a result of improved designs of distilling-oil burners for orchard heating in regions where precautions must be taken against killing frosts. In addition to being economical in the use of oil, these new burners produce little smoke, a welcome improvement in region where a great quantity of oil is burned in orchards in a short time.

Economy in the use of electric current and better lighting of dairy barns is made possible as a result of continued studies and tests of various placements of lights and the use of light-colored paints on walls. The investigators are satisfied that in many cases barns can be better lighted in the right places with less current than is now used.

More dependable storage for various grains is now possible as a result of new facts developed through extensive studies in different parts of the country. The developments include determinations on safety moisture limits in grain in different regions, ways of handling grain in danger of spoiling, and designs of bins in which wind power is used for forced ventilation. Engineers engaged in this work were of great assistance in obtaining suitable storage for millions of bushels of wheat and shelled corn carrying Government loans.

Potato storage can now be made much more efficient as a result of studies of storage houses of different design, ventilation, and heating. An outstanding development that holds possibilities for saving potatoes in farm storages as well as trackside storages is a house in which the cold air circulates within hollow walls and causes moisture from the potatoes to condense on a metal inside-wall covering and to run down and out of the building without wetting the potatoes or the timbers of the structure. This type of storage can be handled with less expense for heating and care. Such savings of crops have become of more than ordinary significance as demands for war production become greater.

Since one-third of the farms in the United States now have electricity the research on profitable use of electricity on farms, started by the Bureau about 2 years ago, is directed toward the assistance of millions of farm people. Although this research is new, with the help of State experiment stations the Bureau has made considerable progress in the development of more economical and convenient means of carrying on various processes and jobs on the farm. Re-

sults include improved methods and equipment, particularly from the standpoint of the small farmer, for brooding chicks, cooling eggs, and preventing spoilage of dressed poultry. Economical contributions to convenience include such equipment, designed by the engineers, as wood-barrel water heaters that can be made on the farm, a motor-operated crosscut saw for cutting up wood for fuel, and heaters for warming water for livestock.

## WAR ON INSECTS HAS MILITARY IMPORTANCE

History warns us that war may provide an opportunity for insects of economic importance to become distributed and established in new regions. The hessian fly, one of our important pests of small grains, particularly wheat, found its way into the United States when soldiers from other countries came to fight in our war for independence. Soldiers, with their possessions and animals, in moving from the Southwest to concentration and training points in the Southeast during World War I, are believed to have provided the means by which the Mexican bean beetle was transported from the area of its natural distribution in the arid Southwest to the vicinity of Birmingham, Ala., from which locality it spread northward and eastward and became the ranking insect pest of green beans over a wide area.

Operators of grain storages in the Middle West and South are confident that the large quantities of wheat produced in Australia and used in this country to replace supplies shipped to England are responsible for the rapid increase of the lesser grain borer, a pest of stored grain which previously was of little importance there although beetle specialists had observed its occurrence in the United States in 1861. There is also much to suggest that flag smut of wheat became established in the few areas where it occurs in the Middle West through replacement wheat.

History interpreted with present knowledge tells of instances where insects have played an important part in the welfare of countries. The prevalence of plague transmitted by fleas, and of malaria and other diseases transmitted by mosquitoes, has been intensified by war activities. Lice have impaired the efficiency and the health of soldiers during many wars. Soldiers in former times had to eat foods badly spoiled by contaminating insects and to wear clothing riddled by clothes moths and carpet beetles. They regarded mosquitoes, houseflies, and many other insect pests as unavoidable though undesirable associates of camp life. Wood supplies frequently had to be discarded because they had been damaged by powder-post beetles, termites, and other boring insects.

In the Department the agency concerned with work on insects and plant pests is the Bureau of Entomology and Plant Quarantine. It has joined defense units and within the limit of its funds and authority is helping to meet the wide variety of needs associated with the National Defense Program.

There are many kinds of insects which transmit diseases of man and animals or attack and annoy them and materially reduce their efficiency. Many other kinds breed in materials used for food, clothing, and construction and cause excessive waste of such materials. The concentration of large numbers of men, animals, and foodstuffs

in defense operations produces conditions particularly favorable for the development of important insect pests. Control measures, however, will do much to prevent the transmission of diseases and the annoyance and destruction caused by these pests. The first step is to determine the particular kind of insect concerned. The life history and habits of numerous species differ so greatly that without this basic information nothing effective can be done. The Bureau has brought together the most recent information on insects associated with the concentration of men, animals, and foodstuffs. It has published the data in a special series of circulars prepared primarily for use of other governmental agencies.

The character of many kinds of insect pests, particularly mosquitoes and other forms that transmit diseases, is very obscure. There is no simple description that will enable persons not familiar with insects to recognize the important species. So that its specialists may promptly examine specimens sent in, the Bureau has curtailed some of its other important activities. Requests from defense agencies have the right of way. The number of such requests is increasing as the importance of insect pests in defense work comes more widely into notice.

### Defense Applications of Entomology

Mosquitoes of various kinds, especially the vicious biting species that breed in salt marshes, and related insects that bite man, occur in large numbers in and near areas selected as military concentration and training points. The Bureau has assigned specialists to make special surveys and prepare preliminary plans for insect-control operations in these localities. The experience gained in control procedures and the knowledge acquired in the research are finding a very widespread application.

Termites attack wood in buildings. Investigations have developed safeguards. The Department is making the results available to all Federal agencies that have responsibility for the construction of buildings, with the general object of protecting the investment and keeping down the maintenance cost. Entomologists are working closely with architects and construction supervisors, and suggesting minor modifications in plans that often make possible material savings in construction costs and at the same time assure the reasonable permanency of buildings constructed as a part of the national defense effort.

Research has developed various ways of protecting woolen fabrics from infestation and damage by clothes moths, carpet beetles, and related insects. Materials used by manufacturers and commercial concerns for these purposes, however, differ greatly in their efficacy. Many treatments are relatively new and have not been standardized or subjected to severe tests. The Department is assisting defense agencies in determining the relative value of proposed treatments. It makes tests of the treatments and processes proposed by industrial concerns that want to get contracts for supplying pest-control materials.

Changes in international commerce, shifts as to the sources of imported commodities, irregular and unannounced arrival of vessels, and the increase in ship arrivals from countries in the Western Hemisphere,

have presented problems in the enforcement of plant quarantines. Quarantine inspectors have worked long hours to prevent the entry of new plant pests inimical to our agriculture. Commodities offered for import from countries other than those from which such products were received during normal times present numerous problems. The increase in air transportation has necessitated many changes in quarantine operations. So that docks and warehouses can be kept available for handling defense products, the inspection of imported plant material has been expedited. For example, at the port of New York the time it may remain on the docks has been reduced from 10 to 5 days. Transports and similar ships from Hawaii are given plant-quarantine inspection immediately instead of just during daylight. Action has been taken to eliminate delay in the movement of plant products from Hawaii to the mainland. Expansion of defense activities in Hawaii has increased the number of parcels sent by mail and express more than 100 percent within the last few months.

Recreation facilities provided for Army selectees at Gulfport, Miss., are located within the area infested by the white-fringed beetle. This recently introduced wingless pest attacks a wide variety of crops and is a potential pest to large sections of the country. It reproduces parthenogenetically and may be easily transported into new areas on various articles that may be used by the troops. So that precautions against the establishment of infestations in new areas may interfere as little as possible with the Army's use of the recreation facilities, special control measures have been applied in and near the recreation camp.

The concentration of corn and wheat in warehouses, terminals, and farmers' bins has materially increased the difficulty of protecting these products from insect pests. Insects damage the grain by direct attack. Their presence in it and their feeding increase the temperature-producing conditions that favor molds and rots. There is need for more information on the peculiar conditions under which wheat and corn are stored. The types of bins used and the surrounding conditions preclude the use of certain standard fumigants. In certain types of bins infestation develops in the top few inches of the grain. It results in a close blanket of insect webbing and grain fragments which prevent penetration by the fumigants. Entomologists found that a light application of mineral oil would prevent these infestations and allow the use of fumigants. There is a shortage of some of the materials required in the manufacture of fumigants. Studies to develop other fumigants give hope that this problem may be solved shortly.

### Tests of New Insecticides

Certain chemicals that have come into wide use in recent years for the control of insect pests are made from materials not produced in this country. Curtailment of shipping has already had an effect on the importation of these materials. Experiments to determine the possibility of substituting one of four different materials which have been invented and patented and which can be produced synthetically from available noncompetitive products are under way. If the results confirm preliminary laboratory observations, it may be possible to produce these new insecticides in quantities sufficient to

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relieve any shortages that may occur. This may affect the continuous effort that must be made to combat insect pests. There is need to determine better methods for control of insects, to develop insecticides that will not leave objectionable residues on the marketed product, that will not reduce the fertility of our soils, and that will not be hazardous to those who produce and use them.

The production of sufficient quantities of seed of the newly developed disease-resistant varieties of the sugar beet is of special significance at present. Certain insects limit the production of this seed in the sections of the country that now produce the largest quantities. The application of control measures developed by the Bureau of Entomology and Plant Quarantine has enabled the beet-seed growers to increase their output. Much more information has to be developed, however, before seed production can be put on a sound basis. Special emphasis is being placed on perfecting control measures, and on ascertaining the status of the damaging insects in new areas that may be suitable for seed production.

Considerable numbers of cattle were brought into parts of the Southeast from Mexico for fattening early this season. This action, together with the unusually favorable season, increased the abundance of the screwworm in Arizona and western Texas. This primary pest of livestock is responsible even under normal conditions for excessive annual losses. Heavy populations of it early in the season and their continuation were particularly disturbing because of the loss of young animals, which the pest kills more easily than it does the mature animals. Research for more effective ways of combating the screwworm has developed a medicine which is still so new that it is referred to under the laboratory test name, "Smear 62."

Use of the medicine in an educational and demonstrational effort in Arizona and western Texas materially reduced the screwworm losses and demonstrated the effectiveness of the new medicine under the conditions that exist in that area. The new treatment reduces the work to a single operation which kills the larva within the wound and prevents reinfestation.

Large quantities of lumber have been shipped for defense purposes from the area infested by the gypsy moth. Plant quarantine inspectors inspect the lumber and free it from egg clusters that might establish the gypsy moth in new areas. Timber owners and forest operators in parts of northeastern California are using facts recently developed by the Bureau with regard to logging operations in areas that contain large numbers of trees highly susceptible to tree-killing bark beetles. This application of research helps forest operators to supply defense needs and at the same time to lessen possible destruction of forest stands by bark beetles. Special studies in forest areas of Oregon will determine areas there that contain large numbers of trees particularly susceptible to attack by bark beetles.

The most satisfactory single method for control of the boll weevil is the use of calcium arsenate dust developed as a result of investigations years ago in this Department. In many localities and seasons, however, the use of this dust accelerates the development of large numbers of the cotton aphid, or plant louse, which reduces the yield and quality of the cotton. Investigations have shown that the addition of small amounts of insecticides containing rotenone to

the calcium arsenate dust prevents the development of serious aphid infestations. There was an extensive outbreak of the boll weevil during the past season, and this discovery was timely. Many farmers applied the new mixtures.

In the irrigated sections of the Southwest it is usually impracticable to use ground machines to apply insecticides to control insects that attack cotton. Certain native sucking bugs greatly reduce the yield and quality of the cotton produced in this area. Research has determined the insecticide which will control these bugs, and field tests with airplanes have shown that measures now recommended may increase the yield of short-staple cotton by about 575 pounds per acre and the yield of long-staple cotton by about 260 pounds with a net average gain of about $9 per acre.

## THE COMMODITY EXCHANGES

Regulation of futures trading in agricultural commodities is a duty which the Department administers through the Commodity Exchange Administration. New responsibilities were entrusted to the CEA in the fiscal year 1941 by the enactment of the Pace amendment to the Commodity Exchange Act, and also by requirements of the national-defense program.

Though not conceived as emergency legislation, the Pace amendment had emergency value. Approved October 9, 1940, it enabled the Commodity Exchange Administration to regulate futures trading in soybeans, lard, cottonseed oil, and other essential defense commodities. Trading in Pace-amendment commodities increased from approximately 400 million dollars in the 1940 fiscal year to more than 1 billion dollars in the fiscal year 1941. Controls and safeguards against manipulative practices were set up under the new legislation in the fats and oils markets in Chicago, New York, and New Orleans. These regulations are similar to those maintained under earlier legislation for grain, cotton, and other commodities.

Although the cotton- and wheat-loan programs tend to reduce futures trading, dealers, processors, and distributors continue to use the futures markets for hedging and price-basing purposes. Trade interests that seek protection against price declines on actual commodity holdings take short hedging positions in the futures markets. Although futures contracts in the two principal commodities—wheat and cotton—have declined for the past few years, the short hedging positions of reporting traders have been substantial in amount. Moreover, their holdings as a percentage of the total holdings have been relatively stable. This indicates the ability of the hedging and risk-bearing functions of the futures markets to render service even in times of rapidly changing ecconomic conditions.

In the summer and autumn of 1940, after the fall of France and during the period of intense aerial attacks on England, futures trading in grain and cotton sank to low levels. The fiscal year 1941 showed a decided decrease for both commodities. Trading in grains amounted to 6,738 million bushels in the 1941 fiscal year compared to 10,761 million bushels in 1940; and in cotton, 33 million bales compared to 44,561,000 in 1940.

In 1941 our National Defense Program reversed the outlook for many commodities. The call for tremendous production tended to re-

lieve the surplus-drugged condition of the markets. As the defense effort gained momentum, trading activity in grain and cotton increased. The turn-over in fats and oils reached the highest levels on record. In cottonseed oil, futures trading in the fiscal year 1941 aggregated 3,319 million pounds compared with 2,438 million pounds in 1940; and in lard, 2,421 million pounds compared with 1,507 million pounds in 1940.

In some of the newly regulated commodities the threat of scarcities subjected the markets to speculative pressure. There were indications last spring of excessive speculation in cottonseed oil and soybeans. In May the futures markets for these commodities were asked to raise margin requirements on speculative transactions. This was done. Analysis later of the cottonseed-oil situation showed that speculative holdings had decreased; it revealed no indication of heavy concentration in the market. Yet rapidly rising prices continued to attract attention.

In May all of the exchanges under the Commodity Exchange Act were asked to cooperate in a voluntary program to control speculation and establish a better adjustment of the futures markets to defense needs. Properly functioning futures markets are important to the defense effort because their existence tends to divert speculation from actual commodities. It is in fact less difficult to control speculation in futures than in spot commodities. Hoarding and inventory speculation have a decisive effect on prices because in that type of trading the speculative opportunity is limited to buyers. To render maximum service, however, and keep the markets functioning during the emergency, it is doubly necessary to prevent excessive speculation in futures.

The Commodity Exchange Administration also requested the exchanges to give attention to long-time changes in agricultural marketing and distribution. The problems underlying production adjustment, commodity loans, surplus marketing, and the Ever-Normal Granary will remain after the wartime emergency is past. The farm programs are flexible; but the objective is of a permanent nature—to secure stable agricultural-marketing conditions and stable agricultural prices. It poses problems for the futures markets.

## The Future of Futures Trading

There is small prospect that the futures markets can be reestablished on the basis of wide price fluctuations, of large public participation in futures trading, and of world-wide speculative interest. The room for constructive growth in futures trading lies not in that direction or in any hopes of unrestricted speculation. It lies rather in service to actual trade interests that need protection against price risks, such as merchants, dealers, farm marketing organizations, processors, and distributors. What the future holds is a problem on which research and cooperative discussion can perhaps throw light.

The exchanges have been asked to appoint representative committees to work with the Commodity Exchange Administration for the solution of these problems. All the exchanges have appointed special committees which are in contact with the Commodity Exchange Administration. There is general hope of an effective vol-

untary solution of futures market problems, which will make unnecessary any broad extension of Federal regulatory powers.

Margins required of customers constitute one means of controlling speculative trading. In the past, minimum margin requirements have varied widely among the exchanges; but in most instances have been less than 10 percent. The Commodity Exchange Act does not grant authority to fix margins; yet the Commodity Exchange Administration felt justified this year in requesting higher minimum margin requirements on speculative transactions in a number of commodities. Leading exchanges increased the minimum margins on some commodities, such as soybeans, butter, eggs, potatoes, and cottonseed oil. These increases, however, did not solve the general market problem; they did not prevent the switching of speculative accounts from one commodity or market to another. Consequently, the Commodity Exchange Administration asked all the exchanges to consider the adoption of uniform minimum margins of at least 15 percent on speculative trades in all commodities.

As an added precaution during the emergency, the Administration instituted special surveys of trading, particularly in the scarcity-threatened commodities. Going beyond the reports customarily required of the exchanges and large traders, it obtained an actual count of all traders in the market and of the extent of their positions; the survey covered the small nonreporting traders whose influx into the market might become an inflationary factor. Such surveys were made of trading in cottonseed oil, butter, and lard. Surveys of trading in other commodities are in progress.

The Commodity Exchange Administration took steps also to bring organized farm groups into closer touch with futures trading problems. The four major farm organizations are helping to set up a representative advisory committee, with which the CEA will consult regularly.

## EXTENSION WORK IN THE FOOD-FOR-DEFENSE PROGRAM

The call to the Cooperative Extension Service of the Department and to the State agricultural colleges for defense action has required expanded and intensive educational efforts. It has been necessary to keep farm people quickly and accurately informed about the world situation, about our own defense efforts, and about needed adjustments in farming and farm living.

Farm people must understand:

The issues facing democracy and our way of life.

The need for increased production of dairy products, eggs, and other protective foods.

The need of better food habits to make our own people stronger.

The effect of the world situation on the farm and farming generally.

The rules by which the Government is trying to help farmers through price assurances for needed foods, loans, conservation payments, quotas on surplus crops, etc.

Technical requirements for efficient production from their fields, herds, and flocks.

These are all educational needs and to help meet them the Extension Service has county agricultural agents in every county of agricultural importance, home demonstration agents in nearly two-thirds of the counties, 1,650 State subject-matter specialists to advise the agents, and a corps of 700,000 volunteer local leaders organized and trained in helping to plan and lead community extension projects.

Through meetings of farm people, personal visits, demonstrations, discussion groups, planning committees, local news stories, regular radio programs, bulletins, local exhibits, tours, circular letters, and other educational devices, extension agents have focused major attention on food for defense needs, facts about the farm situation and outlook, the proper use of the land, needed production adjustments, home food production, better food habits, and discussion of the issues that face democracy.

Extension home-food-production committees have been established in practically every State. Expanded coordinated food production and preservation programs have been launched.

Within 10 days after the Department began its food-for-defense program, Federal extension workers had visited every State. They cooperated with State forces in programs for encouraging and helping farm people produce the needed pork, dairy, and poultry products, tomatoes, and other foods.

In most communities extension agents took the lead. Conferences among farmers and manufacturers, distributors, and cooperative association leaders dealt with marketing, distribution, and processing. Efforts were made to assure adequate facilities in all areas. Information also reached farm people through cooperative marketing and purchasing associations organized or assisted by extension agents during the year. These associations included nearly a million farmer members.

Through 1,140,000 members of organized home-demonstration clubs, food-for-defense facts and increased home-food-production needs came to the attention of farm women in every farm community.

Home gardening, health and nutrition, and food-production projects received the attention of nearly 1½ million farm boys and girls in 4–H Clubs.

Locally applicable subject matter was made available telling farmers how they could get more milk from their cows and more eggs from their hens. For example, in North Carolina, 350,000 copies of several bulletins and leaflets on home-food-production plans were printed. Practically every farm family in the State received a set of these publications. Extension agents and local leaders obtained pledges from farm families that they would do everything possible to meet the defense requirements.

Food-for-defense efforts naturally vary in different areas. In Wisconsin extension workers were putting major emphasis on milk production and the shifting of milk from other uses into needed cheese. In Nebraska and the Northeast they helped farmers in adjusting their programs to drought conditions. Alabama agents established a garden demonstration in every community. Kansas workers emphasized increased production of eggs for drying. Corn-belt extension workers helped farmers to produce meats and other products needed for export to England and other countries.

Programs for better nutrition, improved food habits, and more production and preservation of foods for farm-home needs received increased attention. "Make America strong by making Americans stronger" was a widely used slogan.

Surveys to determine the causes of inadequate home-food supplies and poor food habits pointed generally to low income, uncertain tenure of the land, difficult landlord-tenant relations, draught, and lack of irrigation, insect-control problems, poor soil, and lack of food-storage and preservation facilities. The Extension Service directed major educational and organizational efforts to these problems. It aided farmers to take advantage of available Government programs and to undertake cooperative efforts themselves.

In nutrition work the most difficult task extension agents have is to combat traditional attitudes and long-established unwise food habits. These are very similar in widely separated regions. Simple food demonstrations have been effective. Many parents have been reached through their children in 4–H Clubs. Thousands of new contacts have been established at mattress-making centers, through school-lunch programs, and in health clinics. Home-demonstration agents have done fundamental work in developing better food habits among farm people, and in training farm women to be local leaders. More than 110,000 farm women have given time and skill as local leaders in food and nutritional educational work this year. Through these and other Extension Service activities some 1.7 million rural homes have been led to adopt improved food and other homemaking practices.

Extension agents have assisted groups of farm people in systematic group discussions, which have dealt with the national emergency, with problems of democracy, and with ways of meeting them.

## CIVILIAN CONSERVATION CORPS ACTIVITIES

Through five of its bureaus, the Department continued during the year to plan, supervise, and carry on a wide variety of conservation work with the assistance of the Civilian Conservation Corps. Many types of the work were those which the Corps has carried on since 1933. There was increased emphasis, however, on work and training to fit the enrollees either for defense jobs or for direct national defense. The CCC activities included tree planting, soil saving, protection of forests from fires and from injurious forest insects and tree diseases, improvement of forests by the removal of dead, down, diseased, and worthless trees, the development of public campgrounds, wildlife conservation, and the construction of forest improvements such as roads, trails, bridges, telephone lines, fences, cabins, storehouses, and shelters. In addition, the CCC camps helped in emergency work on military reservations. An example was the transfer early in the fall of 1940 of two companies for a special airplane landing field in Alaska.

In direct cooperation with the War Department in national defense, the Department of Agriculture gave up 27 of its CCC camps for work on military reservations, Army hospitals, and on national defense airfields. The Forest Service relinquished 21 camps, the Soil Conservation Service 5 camps, and the Beltsville Research Center 1 camp. Project superintendents, foremen, and in some cases technicians went

with the companies to direct and supervise construction projects for the Army and Navy. Military posts and airfields received this aid in Alabama, California, Florida, Georgia, Louisiana, Maryland, Massachusetts, Mississippi, Missouri, New Jersey, South Carolina, Tennessee, Vermont, and Washington, and in Alaska and Puerto Rico. Additional camps are being relinquished, some to general military hospitals as well as to military reservations.

There was special activity in training enrollees to meet defense needs. Priorities were established for training in the jobs of greatest importance to the Nation, training procedure was improved, and equipment and shops were made available for courses conducted by State vocational education departments under authority of the Federal Government. Major emphasis was placed on training enrollees for specific jobs; they received general training as well.

The Department's camp supervisory personnel received permission to accept appointments as part-time instructors by State vocational education departments for a time. This permitted initiation of national defense courses more rapidly than might otherwise have been possible, and gave the States more time to get permanent instructors. Approximately 9,000 supervisory employees in the Department's camps helped during the year to instruct enrollees in various specific accomplishments. The instruction qualified youths in the following categories:

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| 1. Operators of trucks, tractors, power shovels, draglines, air hammers, crushers, and other heavy-equipment and maintenance men | 39,325 |
| 2. Road-construction workers and bridge builders | 35,640 |
| 3. Building-construction men (including workers in concrete, practical carpenters, stone masons, painters, electricians, and plumbers) | 16,300 |
| 4. Clerks, warehousemen, cooks and bakers, mess and supply stewards and infirmary attendants | 9,560 |
| 5. Welders, blacksmiths, axmen, saw filers, sawmill men | 7,985 |
| 6. Blasters and quarry workers | 7,460 |
| 7. Telephone-line-construction workers and radio operators | 5,600 |
| 8. Surveyors, map makers, map readers, and draftsmen | 1,600 |

During 1941 there was an average of 1,003 CCC camps under the direct supervision of various bureaus of the Department, 12 less than in the previous fiscal year. The break-down was: National forests, 315 camps; State forests, 173; privately owned forests, 94; Soil Conservation Service, 388; Plant Industry, 2; Beltsville Research Center, 3; Animal Industry, 1; Entomology and Plant Quarantine, 1; for the Tennessee Valley Authority, 18. By the end of the fiscal year, a total of 25 camps were so assigned. There were some camps supervised by the Department in each of the States and in the District of Columbia. In addition, the Forest Service continued to supervise the Department CCC work in Alaska and all CCC work in Puerto Rico. In these territorial and insular possessions' camps the War Department functions solely as paymaster.

## PERSONNEL ADMINISTRATION

The activities of the Department of Agriculture can never be anything more than the sum of the activities of the more than 89,000 people who work for the Department. The Department's contribution to the defense effort is simply the sum of the individual contributions of these people.

These are simple facts, but it is necessary to keep them in mind to understand the important part which good personnel administration can play in increasing the total effectiveness of the Department's programs. For the special function of personnel administration is to bring about maximum utilization of the resources of human energy available to the Department. Central and bureau personnel offices and supervisory officials all up and down the line share responsibility for carrying out this function.

The Department recognizes that there are just three ways of increasing the amount of applied human energy devoted to its programs. First, the number of people at work can be increased. While this has been done in the past year in some areas particularly connected with the defense effort, total Department employment was reduced by some 7,000 in 1941 in the interests of economy and because of the curtailment of certain programs.

Second, the store of applied energy can be increased by increasing the number of hours each person works. This method is useful only in the short run, for it inevitably takes a physical toll on worker efficiency. In the past year many Department employees worked far beyond the prescribed hours, but we hope they will not have to continue doing so for long.

The third and, in the long run, the most fruitful way of increasing the total amount of work done is to increase the effective output of each man-hour of work. This is the end to which most of the personnel efforts of the Department have been devoted. In the Department, as elsewhere, the only ways of achieving this end, other than by the shortsighted and undesirable speed-up, has been, and will continue to be, to improve the organization and methods by which the Department's work is done; to increase the level of skill of the people employed by the Department; and to increase the will of those people to work.

Organization and methods were improved by a conscious and continuous process of study and rationalization. In this area almost every major bureau of the Department had full-time procedure study units at work in 1941. The Office of Personnel alone made more than 150 major and minor organizational studies in the bureaus during the year.

To the end of increasing the level of skill of its employees, the Department continued its cooperation with the Civil Service Commission in preparing examinations to select the best qualified people for original appointment. Within the Department, improved testing facilities for non-civil-service appointments and promotional examinations were developed and a central recruiting and training unit for Washington stenographers and messengers was established. Training activities for all employees were intensified both in technical fields and such matters as letter writing, telephone service, and general improvement of service to the public.

### Maintenance of Morale

In its stated policies and in its day-to-day personnel activities, the Department recognizes that the worker's will to work is at once the most important and the most sensitive factor affecting the produc-

tivity of its employees. Through its own experience and by studying the experience of progressive private industries, the Department has learned that this will can only be maintained at a high level by maintaining the highest possible morale. High morale, in turn, can only be achieved by a careful adjustment of the worker to his particular job; by giving him free opportunity to develop and use his abilities; by assuring reasonable security and continuity of employment; by providing comfortable surroundings, both physical and psychological, on the job; by showing the worker worth-while personal and group goals and providing leadership toward the attainment of those goals; by preserving the physical and mental health of the worker; by maintaining reasonable safety standards; and, above all, by dealing with him fairly in matters of pay, promotion, discipline, adjustment of grievances, and all other things affecting his work life.

It is important to note that in this listing the conditions which are good from the piont of view of the worker and the conditions which are good from the point of view of the Department are almost synonymous, so direct is the cause-and-effect relationship between worker satisfaction and maximum output.

On this broad front, developments in the Department were numerous in 1941. The Department established a minimum-wage policy for all of its laborers, thus giving them protection similar to that provided by law for employees of private industry. Special regulations were established and a special board was set up to assure fairness and uniformity in dealing with requests for occupational deferments under the Selective Service Law. An aggressive safety program was pursued, aimed at reducing accidents resulting from the hazardous work performed by many Department employees in the field. A new all-time low accident rate was set, with a reduction of 28 percent from the preceding year. A revised and more rapid procedure in connection with appeals on employee grievances was put into effect.

In the internal workings of the personnel system, particular emphasis was placed on realignment of personnel responsibilities to place them as near to the worker himself as the dictates of law and maximum efficiency permit, and on improving the personnel process to speed the flow of actions. Authority was delegated to field employment officers to appoint personnel through the District Civil Service offices and make other personnel changes affecting large groups of field employees, with only a post-audit by the Office of Personnel, thus eliminating a major cause of delay in such actions. The system of communicating information on personnel matters to bureau officials and employees was improved. The Division of Employment was reorganized to provide for liaison squads, each dealing with the recruitment and placement problems of a single group of bureaus, thus providing more personalized service and securing speedier action. General improvement of personnel methods resulted in major reductions in the time required for the clearance of classification and other personnel actions and a reduction of over 40 percent in the volume of mail coming into and leaving the Office of Personnel. Thus paper work was reduced and the time of the staff freed for more constructive personnel activities.

Special personnel problems were presented in 1941 by the impact of the defense program; the overcrowded conditions in Washington; and the passage of the Ramspeck Civil Service Act.

## Personnel Problems and Defense

The defense emergency, which acted to increase the urgency of the need for effective personnel administration, acted at the same time to add to the scope and difficulty of personnel problems. The new defense work undertaken by the Department brought demands for new personnel and retraining of old personnel. Meanwhile some 1,327 employees left for military duty, while some 4,957 others left to accept positions, many of a defense nature, in other Government agencies and private employment. Replacements had to be found for these people in an increasingly competitive labor market. The question of the adjustment of employee salaries generally and for groups especially in demand to meet rising costs of living and rising salaries elsewhere, which was so serious in the last war, was again a problem. The relative inflexibility of government pay scales has caused difficulties.

On the whole, however, the impact of the National Defense Program on the personnel situation in the Department was not so severe as that of previous emergencies. From 1917 to 1918, for instance, the Department had to increase its total personnel by more than 25 percent in a single year. An increase of over 31 percent was necessary from 1933 to 1934. From 1940 to 1941, as has been said, the total number of employees of the Department showed an actual decrease. By and large, the Department was already staffed to handle most of the tasks arising out of the new emergency, with only the redirection, replacement, and salary-adjustment problems already mentioned presenting special difficulties.

The overcrowded conditions in Washington brought considerable pressure for further decentralization of activities. The Department undertook special studies along these lines and some moves of personnel to the field were contemplated as the year ended. In general, however, it would seem that the Department, which already has over 85 percent of its employees in the field as a result of a long-continued policy of decentralization, could not make very many further large-scale moves of agencies to the field without seriously disrupting intra-departmental and interdepartmental relationships which are essential to effective administration.

The Ramspeck Civil Service Act, passed in November 1940, will eventually give some 16,000 employees of the Department the protection of civil-service status. While this act represents a major forward step in the achievement of employee security, carrying it into effect will present problems in such fields as examination, classification, retirement work, and training. The heaviest impact of these problems will come during the fiscal year 1942, but much effort in 1941 was devoted to laying the groundwork for the expeditious performance of these tasks.

For the future the Department plans to press for further rationalization and improvement of personnel work to the end that the program may be successfully adjusted to the increasing pressures of current personnel needs and will continue to move toward the long-range goal of maximum effective utilization of its human resources.

*Secretary of Agriculture.*

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